Two Clinical Lectures
ON
MALARIA AND THE MALARIAL PARASITE.

Delivered at the Medical Graduates' College and Polyclinic,

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LECTURE II.[1]

Delivered on Feb. 28th, 1900.

GENTLEMEN,—The morbid anatomy of malaria is fairly constant, consisting principally of enlargement of the spleen, congestion of the liver and portal circulation, and pigmentation of the spleen, liver, brain, and many other viscera. The microscopic anatomy, too, is fairly constant. In sections of all the organs mentioned, in the vessels in every instance, and, in the case of the spleen and bone-marrow, in the parenchyma also, there is to be found a remarkable deposit of the peculiar pigment which is so characteristic of malaria. This pigmentation arises from (*a*) the pigment belonging to and contained in living parasites—those little aggregations of pigment which I described as a feature in all mature malaria parasites—and (*b*) from the same pigment included in leucocytes, in endothelium, and, in the case of the spleen and bone-marrow, in the cells of the parenchyma. If you study sections of brain from cases of fatal malarial fever you will often see the capillaries distinctly outlined by the pigmented malaria organisms which they contain. The whole of the lumen of the capillary network is occupied by corpuscles containing little pigment masses. By carefully focussing you will see that each pigment mass is included in a red blood-corpuscle. Sometimes about the centre of a corpuscle you will see the mass of black pigment and surrounding this a body which you may be able to resolve into a cluster of minute sporules. This crowding of the vessels of the brain with parasites affords ample explanation of many of the phenomena of that type of malaria known as pernicious cerebral malaria. In sections of liver you will see a similar arrangement—pigmented parasites, and, much more abundantly than in the case of the brain, masses of pigment in leucocytes and here and there in endothelium. In the case of the spleen in one of the preparations which I show this afternoon you can see, besides the small parasites, each with its little mass of melanin in the capillaries, and besides small pigment-laden splenic cells, huge cells filled apparently with large block-like masses as of charcoal. The bone-marrow specimen exhibits similar appearances. Like the spleen, it contains the malarial pigment outside as well as inside the vessels. In the preparation of mesentery also you can trace a delicate capillary dotted here and there with pigmented sporulating parasites. In chronic malarial conditions you have secondary changes, fibrotic and so forth. These, of course, are not peculiar to malarial disease.

In addition to the black pigment, particularly in those cases of malaria which are accompanied with extensive rapid destruction of blood-corpuscles, you will find another type of pigment—a yellow pigment. This pigment is present in all conditions, accompanied by acute blood destruction. It is not peculiar to malaria; it is found in the hæmolysis attending extensive burns, in poisoning by chlorate of potash or arseniuretted hydrogen, in paroxysmal hæmoglobinuria, and so forth. This pigment is deposited hæmoglobin.

Another and important feature in the pathological anatomy of malaria, and one which you will discover by a careful examination of the blood in the living subject, is anæmia—an intense and, in acute cases, generally a rapidly advancing anæmia. If you examine a patient from time to time after successive malarial paroxysms you will find that the drop in the number of blood-corpuscles per cubic millimetre is very great indeed. In the course of a severe untreated attack the patient is reduced to a condition of intense pallor with a rapidity hardly equalled in any other disease. It is not so, of course, in every case, but in bad types you will find that this holds true. The cause of this excessive anæmia is not very obvious if we rely simply on examination of the blood from the finger for an explanation. If you place finger-blood from a case of malaria under the microscope you may find one or two parasites perhaps in each field. In many cases of severe malaria you will not find so many as that even; sometimes you will have to search through three, four, or five fields before you find one parasite.

How, you may ask, could so small a number of blood-destroying parasites account for anæmia so pronounced and so rapidly evolved? The reason is that the malaria parasite is not especially, or even ordinarily, a parasite of the peripheral circulation. It is a parasite of the blood of the central organs, as evidenced by the specimens shown this afternoon under the microscope. In a case of comatose pernicious malarial fever, with perhaps only three or four or five parasites in every field of finger-blood, you will find post mortem almost every blood-corpuscle in the capillaries of the brain carrying its own parasite. That is the reason why blood destruction is so prominent a feature in severe malarial attacks. The blood is not destroyed by the few straggling parasites seen in the peripheral circulation, but by the myriads of parasites in the blood of the viscera—the brain, the liver, the spleen, the bone-marrow, and so forth.

The behaviour of the leucocytes also is an interesting feature in the pathology of malaria. The polynuclear leucocytes decrease notably in number during the acute stages of malarial attacks; sometimes you may have a difficulty in finding them in the peripheral blood. The large mono-nuclear white cells increase as a rule and often contain malarial pigment. These large mononuclear corpuscles, as well as a certain number of the polynuclear corpuscles, carry the pigment to the spleen and there deposit their burden, which is taken up by the cells of this organ, producing the greater part of that enormous deposit of pigment so clearly illustrated by one of the sections under the microscope.

A peculiar feature clinically about malarial disease is its periodicity. This periodicity is accounted for by the periodicity and simultaneity of development of the parasites; they all seem to keep together as a swarm. At a particular time of the malarial clinical cycle you will find a certain form of parasite in the blood. Just before the explosion of the fever you will find a predominance of the rosette bodies; after the fever has subsided you will find the small form of the parasite as the predominant feature, and so on. Why should this be? Why should there be a conspiracy, as it were, among the different parasites all to mature at a certain time and all at the same stage? This simultaneity of maturation, so to speak, is the reason for the intermittence and regular periodicity of malarial fever. But what is the reason for the parasites observing this periodicity? The question is a very difficult one to answer. I believe the reason is twofold: first, the habit of the parasite to live a more or less definite number of hours; and, secondly, the diurnal rhythm in the periodicity of the physiological processes of the human body. At a certain time of the day in health the body temperature begins to rise and at a certain time it begins to fall; so with the tendency to sleep, to eat, to secrete, and to excrete particular substances there is a definite diurnal periodicity in the normal physiological cycle. This diurnal physiological periodicity, combined with the tendency of the parasite to live for a definite time impresses, I would suggest, the periodicity on the parasite of malaria which is so very characteristic of it and of the disease it produces.

So far as is known the lower animals are absolutely immune as regards the human forms of malarial disease. If you inject human malarial blood into a monkey there is no subsequent proliferation of the parasite and no fever. The same is the case with the dog or horse or other animals. Therefore in the lower animals there is complete immunity as regards the malarial parasite. We also know that certain human beings, very few it is true, enjoy a similar absolute immunity as regards this parasite. Some people coming into a malarial district contract the disease within a week or ten days of their arrival, others resist the disease for months, and a very few resist it permanently. That fact shows that *qua* the malarial parasite there is a varying degree of immunity in the same human body and in different individuals. I believe that this immunity possessed by the human body, like other physiological properties, has, as regards its amount a diurnal rhythm. At one time of the day the resistive power against a malaria parasite is greater

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than at another time of the day. I think that any malaria parasite which might enter or be set free in the blood when the immunising power of the body is at its height is likely to be destroyed by the resistive power. Should it happen that the power of resistance is at its minimum, then the parasite would survive, enter a blood-corpuscle, mature, and propagate its kind. In that way, it may be, the periodicity of malaria is caused—viz., by the combination of physiological conditions and the properties, so to speak, of the parasites.

We know when the new-comer arrives in a malarial country his first attack of malaria is usually a very severe one; it is usually either a continued or a remittent fever; that is to say, the fever does not exhibit in any marked way the definite periodicity which we are accustomed to associate with malaria. Apparently the parasites are permitted to enter the blood-corpuscles and mature at all times of the 24 hours. After a time, however, the body seems to become educated to a certain extent, so that by-and-by a definite periodicity is impressed upon the parasite and the continued fever after a time becomes remittent and by-and-by intermittent. I would interpret this by supposing that the body gradually acquires a certain degree of immunity and reaches at some time in the 24 hours the standard of absolute immunity and that in this way the parasite and the symptoms it gives rise to get a definite periodicity impressed upon them.

It is almost useless for me to attempt to describe the manifold clinical forms of malarial disease. We know that malarial fevers tend to assume a quotidian, a tertian, or a quartan type. We also know that in certain cases the quotidian becomes a remittent or continued fever. We also know that if we examine the blood in remittent or in continued malarial fevers we sometimes find in it the type of parasite characteristic of tertian, sometimes of quartan, sometimes of the æstivo-autumnal infection, and sometimes a mixture of two or even of all the types of parasites. At first it seems difficult to understand how a tertian or a quartan parasite could give rise to a quotidian fever. But such is the case and there can be no doubt that it can be explained. If you look at the blood of a patient with quotidian fever in very few instances will you find a quotidian parasite, which is amongst the rarest of malarial infections, if, indeed, it exists at all. You will find generally either a tertian, a quartan, or an æstivo-autumnal, which is also tertian in its periodicity. In the case of a quotidian fever arising from a tertian infection there are two generations of parasites, one which is half-matured and one which is practically matured. The half-matured parasites will produce the fever of to-morrow and of three days hence, the fully-matured will produce the fever of to-day and that of the day after to-morrow, and so on. A double quartan infection will produce a double quartan fever. You get fever to-day and to-morrow but no fever the day after to-morrow. A treble quartan infection, in the same way, will produce a quotidian fever. If the three forms of parasites concur you will have a corresponding mixture of clinical symptoms. You will easily understand how confused the resulting clinical manifestation will be from this fusion of forms, but with the microscope and the temperature chart you can unravel the clinical puzzle and read, so to speak, the writing in the blood.

Disregarding the ordinary intermittents, I will say a word about pernicious malarial fevers, a type which has been very much neglected by English writers and which is better understood by our French colleagues—at all events it is more dwelt on by them.

In the course of what appears to be an ordinary ague, and which we do not ordinarily associate with any particular danger, there is suddenly developed some alarming symptom which if it be not properly appreciated may prove fatal, and that in the course of a very few hours. These are called pernicious attacks (*accès pernicieux*), and are classified under two headings, one conveniently called "cerebral" and the other "algid," the latter being associated with adynamic conditions, the former with manifest implications of the central nervous system.

The most common type of pernicious attack is known as "pernicious comatose malaria." The patient in the course of what apparently is an ordinary malarial attack suddenly becomes comatose; he cannot be roused, he has stertorous breathing, and unless skilfully treated he may die. Occasionally he comes out of this condition and temporarily recovers, but possibly at the next paroxysm of the fever he will fall into the same condition and die. Often these sudden attacks of insensibility are put down to apoplexy and very often a prognosis of hemiplegia is given. Fortunately for the patient this prognosis is sometimes upset by his coming out of the comatose condition without showing any evidence of hemiplegia.

Another type of pernicious cerebral fever, often mistaken for, and generally called, sunstroke, is hyperpyrexia. The patient has an attack of apparently ordinary ague, in the course of which, instead of his bursting out into perspiration and the symptoms subsiding when the thermometer reaches 105° F., the temperature may go on rising to 107° or 110° or even higher. Wild delirium merges into coma and death Hyperpyrexial attacks are terrible things to witness. I have seen a good many and at first was prone to fall into the ordinary mistake of diagnosing heat-stroke. They occur very often during oppressive weather and are common in intemperate people. The diagnosis of heat-stroke, under the circumstances, is a somewhat natural one to make. On more careful consideration, particularly if the patient's blood is examined or a post-mortem examination is made, you will find, either from the presence of parasites or from pigmentation in the viscera, that the patient died not from heat-stroke but from malarial poisoning. Thus malarial coma and malarial hyperpyrexia are the most frequent and important of the cerebral pernicious types. But there are other forms: a not unusual one, particularly in children, is the epileptiform seizure.

In tropical countries it often happens that the first intimation of malarial infection in a child is an epileptiform seizure. Perhaps two days later there is a similar attack. You are inclined to give a gloomy prognosis; you tell the mother that the child is possibly an epileptic and you prescribe bromide. If you wait for 48 hours longer there is a third seizure and then if you use the microscope and the thermometer you will find that the child is not suffering from true epilepsy but from malarial fever. In adults also you sometimes have strange periodic seizures. One is a suddenly developed aphasia. I have seen this on more than one occasion. You are asked to visit a patient and you find him in bed exhibiting all the peculiarity of some form of aphasia, unable to speak, or using wrong words, misplacing them, and so on, and you are prone to diagnose grave cerebral disease. Occasionally the extrinsic muscles of the eyes are affected with some form of paresis. These cases are more common than is supposed but they are very frequently overlooked.

An explanation of these and similar conditions — the comatose cerebral attacks, the hyperpyrexial attacks, the epileptic seizures, the paretic conditions—is supplied by the brain sections shown under the microscope. You will see that the capillaries of the brain are crowded with malarial parasites. Should one particular centre of the brain be specially affected by the parasites, as, for instance, Broca's convolution, then you have a corresponding symptom. Should the heat-regulating centre—if there be such a centre—be selected then you may have hyperpyretic conditions. The algid attacks are somewhat rarer but they are equally important. It is necessary that one should be aware that such attacks do occur. A malarial fever very like cholera is not an unusual thing in certain districts. The patient, instead of getting an ordinary malarial attack, is suddenly seized with choleraic symptoms—vomiting, purging, rice-water stools, cramps, vox cholerica, and all the other signs of epidemic cholera If you inquire into the history you may learn that he had malarial attacks perhaps only one or two days before. You examine the blood and you find malarial parasites, and if you treat the patient for malaria you will cure his cholera It is well to recollect the possibility of such attacks in tropical countries. Dangerous syncopal attacks may occur in association with the symptom which we usually hail as heralding relief in a malarial paroxysm. Profuse perspiration occurs till the bedding is drenched; if the patient gets up and tries to stand he has, it may be, a fatal syncopal attack. Sometimes profuse sweating occurs at the very commencement of the fever paroxysm; the patient is cold and algid and the profuse sweatings may end perhaps in collapse. In other forms vomiting, dysenteric conditions, and so on occur. Indeed, the variety of clinical features exhibited in malarial infections is too great for me to fully discuss on this occasion.

A practitioner in tropical countries ought always to suspect that any sudden and inexplicable attack may be attributable to malaria. I would emphasise the word *may* because I do not wish it to be understood that such an attack *must* be malarial. We should not conclude, as is so often done, that every case of disease connected with the tropics which we

cannot diagnose is malaria; still, we ought to suspect it. There is one important type of what is believed to be malarial disease which has of late come into prominent notice, partly in consequence of the opening up of Africa and partly in consequence of the utterances of a well-known pioneer in pathology—Professor Koch. I refer to blackwater fever. This is a disease which, strange to say, has not been recognised till within the last 30 or 40 years. If you search the writings of the old Indian physicians you will find no mention of blackwater fever or of any corresponding disease. Some time in the "fifties" certain French physicians first drew attention to its occurrence in one island off the coast of Madagascar, and since that time the disease has been recognised in the West Indies, in South America, in the southern parts of the United States, and in the Malay Archipelago. It is known to be the most common cause of mortality among Europeans on the West Coast of Africa. It exhibits all degrees of intensity. A patient resident in one of the endemic districts who perhaps has had many attacks of ordinary malarial fever develops what at first he considers as one of his usual malarial attacks and he does not think much of it. Suddenly he is seized with severe rigor. (Strange to say, rigor, so prominent a symptom of agues and intermittent fevers in the temperate zones, is singularly rare in the tropical zones. In those countries in which malarial fever is a really dangerous item in the pathology rigor is not as a rule a prominent malarial symptom. In blackwater fever it is different in this respect—violent shivering is a usual initial symptom.) The patient may then be seized with the desire to pass urine; he is astonished to find that his urine is black. He goes on urinating frequently and the urine continues to have this peculiar colour. He looks at himself in the mirror and finds that his face has become as yellow as saffron. This condition is associated very generally with fever, vomiting of biliary material, pain about the loins and back, and severe hepatalgia and intense prostration. Often as the case advances the patient exhibits all the symptoms of sudden profuse haemorrhage (doubtless associated with the great discharge of haemoglobin), giddiness, sweating, sighing, restlessness, and syncope. In many cases fortunately the haemoglobinuria—for such is the symptom—gradually disappears with the fever, the urine becoming less dark and after a time natural in colour, but the patient is left intensely anaemic and jaundiced and only slowly recovers. Very likely there is no relapse. In some cases, however, the symptoms do not subside, the haemoglobinuria persists, and the patient may die from syncope or exhaustion; or, the haemoglobinuria persisting, the urine gradually gets smaller in quantity and becomes thicker and almost glutinous, being reduced to two or three ounces in the 24 hours. It may be entirely suppressed and the patient may die with uraemic symptoms, or he may recover temporarily and the discharge of urine may be re established, but in two or three days or weeks he may die with symptoms of acute nephritis. Blackwater fever is a terrible disease; the mortality from it is enormous, amounting in some epidemics to as much as 50 per cent., in others to 25 per cent. Occasionally the mortality is as low as 10 or 15 per cent. The disease, however, is always a dangerous one, and it is one that is almost sure sooner or later, if the patient remains in the endemic area, to recur. The liability to recurrence unfortunately does not cease when the patient has left the endemic area, for, as with other malarial disease (if it be a malarial disease), symptoms are liable to return or even to appear for the first time after the patient has returned to Europe. I have seen a good many cases in England. Only three weeks ago I saw a young Englishman die from this disease in London. I do not know how long the liability to recurrence persists after return to temperate climates, but certainly it persists for five months. I have known of such cases.

There are certain popular fallacies about the diagnosis of malaria which it is well to bear in mind. The principal of these is that everybody who has passed through the Suez Canal, or who has visited Rome, or has lived in a tropical country, is the subject of malarial infection. That is about the commonest and the most vicious fallacy among practitioners in this country. Fortunately many tropical lands are absolutely free, or relatively free, from malaria; it is only in certain places even in tropical countries that malaria exists. Do not, therefore, when a patient comes from a tropical country complaining of some more or less obscure symptoms, jump to the conclusion that those symptoms are the outcome of a malarial infection. One sees curious mistakes in connexion with this popular fallacy. I recollect reading some time ago in one of the medical papers two cases of what was called "malarial neuritis." I was very much struck with the evidence for founding his diagnosis of malarial neuritis with which the writer appeared to be satisfied. One patient was a sailor, and doubtless in the course of his life as a sailor he had visited malarial countries—*ergo*, his neuritis was malarial; that was all the evidence for the diagnosis. The other case was very much the same, the patient being a sailor who at one time—many years ago—had had malaria; and that was all the evidence which the writer had for diagnosing the case as one of malarial neuritis. This is typical of the diagnosis one often finds of obscure disease in patients from tropical countries.

Few diseases are so easily diagnosed as malaria. We have three pathognomonic tests which, intelligently applied, are absolutely infallible. There is the clinical test of periodicity, but diurnal periodicity is of no value in the diagnosis of malaria. A periodicity of 24 hours is shared with malaria by many diseases, but it is otherwise with a periodicity of 48 hours or 72 hours. Only one pathological condition exhibits this feature and that is the malarial infection. Any disease exhibiting a tertian or quartan periodicity is certainly malarial. But I strongly dissuade you from putting any reliance upon quotidian periodicity in the diagnosis of malaria; it is most misleading and constantly gives rise to mistake. If a patient has well-marked rigor followed by pyrexia, and that by profuse perspiration, and if this occurs day after day, do not jump to the conclusion that the case must be malarial because of the periodicity and because the patient is from a tropical country. In diagnosis quotidian periodicity should be absolutely ignored. I have seen a patient with well-marked abscess of the liver, the patient himself being a medical man, and yet because he had rigor, pyrexia, and perspiration day after day he was sure that he was suffering from malarial fever, and he was taking quinine in consequence. Nearly all suppurative processes are attended by a fever with a quotidian periodicity more or less marked. Osler says that he never sees a case of abscess of liver that has not been drenched with quinine, the diagnosis of malaria having been made doubtless in consequence of the quotidian recurrent pyrexia. Many diseases—ulcerative endocarditis, surgical kidney, gallstones, syphilis, tubercle, almost every disease with febrile associations—may exhibit quotidian periodicity. But it is otherwise with tertian and quartan periodicity; these are both absolutely pathognomonic of malaria. Then we have the therapeutic test—the test by quinine. Quinine properly administered in a case of malarial disease in 48 hours is in my experience invariably followed by abatement of the symptoms. If you give a patient quinine for 72 hours and there is no abatement of fever you should revise your diagnosis; the patient is not suffering from malaria. There is no use in persisting with quinine for days and weeks on the supposition that the case is malaria. You can poison the malaria parasite with quinine as certainly as you can poison a man with arsenic.

It is not sufficient, however, to rely on the therapeutic test, because in many instances we have no time to wait for its application, as in grave cerebral attacks. In such cases you cannot wait to see the effect of quinine before making the diagnosis. By the time the diagnosis is established the patient might be dead. It is necessary to have some more rapid means of arriving at the conclusion of what is the matter with the patient. That is supplied by the microscope; it is an immediate and invaluable test for malaria. Practitioners in tropical countries fail in their duty to their patients if they do not acquaint themselves with the application of the microscope in the diagnosis of malaria. For the practitioner nowadays to undertake the care of life in tropical countries and to be ignorant of the use of the microscope in malarial diagnosis is positively culpable. I think that the practitioner who visits a tropical country and pretends to take care of patients there and who cannot use his microscope is like a physician in England who is ignorant of the use of the stethoscope. Of the two instruments by far the more valuable in tropical practice is the microscope. The microscopic test is easily applied. All that is required is a high-power lens, a $\frac{1}{12}$ objective, a fair illumination and two or three slides, some cover slips, and a patient. In five minutes you can tell whether the patient is suffering from malaria or not. Anyone who ignores

this simple method is not only foolish but I say he is also sinful.

One word in conclusion about the treatment of malaria. This resolves itself into one word, the use of quinine. We have in quinine really a specific (about the only real specific in the Pharmacopœia), and if we can properly apply the specific in 99 cases out of 100 we can save the patient from the effects of the parasite. It is one thing, however, to possess the specific and it is another to be able to apply it. In cases of violent remittent fever and grave cerebral attacks the patient may be vomiting and unable to absorb the drug, or he may be insensible and unable to swallow it. You must have recourse to other means and give five or ten grains of a soluble salt of quinine hypodermically or rather intra-muscularly. This may save the patient; he may die without it. At one time this method of using quinine got out of favour because in several instances the hypodermic injection had been followed by tetanus and the death of the patient. Now, tetanus is not caused by quinine; it is caused by the tetanus bacillus. Death from tetanus following on the hypodermic injection of quinine is caused by the culpable carelessness of the physician who, in ignorance of course, has used an injection containing the tetanus bacillus. The hypodermic injection of quinine, though painful and often objected to by the patient, is free from risk provided that ordinary precautions are taken to render the syringe, the skin, and the solution aseptic.

A certain number of patients appear to have peculiar sensibilities as regards the action of quinine. In some it gives rise to urticaria, in some to peculiar toxic effects, and therefore to some patients it cannot be given at all. In these cases methylene blue is of service. I have not much experience of its use; I have not the same faith in it as I have in quinine. Professor Koch is one authority for its use. It is given in doses of from three to five grains three or four times a day. Another and graver accusation against quinine is that it is apt to give rise to hæmoglobinuria. Professor Koch's utterances in regard to this have been somewhat misunderstood. Many people suppose that Koch said that quinine gave rise to—is the cause or virus, as it were, of—hæmoglobinuria. What he did say was that quinine under certain conditions brought on hæmoglobinuric symptoms, and what he said is in my opinion, true, only he has expressed himself somewhat vaguely. A man is responsible not for his words only but also for the effect which they produce, and Koch's words have had a most prejudicial effect in this matter. In consequence of what he has said quinine is looked upon with suspicion, if it be not absolutely tabooed, in some tropical countries. This is unfortunate, for even if quinine is a danger in certain cases, if it does tend to produce hæmoglobinuria in some cases, it is not a one-hundredth part so dangerous in this respect as the malaria parasite. Of the two evils the parasite is infinitely the greater one, and therefore the withholding of quinine from a patient in whom the parasite is circulating is more apt to be followed by blackwater symptoms than if the drug be given.

In cases of blackwater fever examine the blood and if you find in it the fever forms of the malarial parasite give quinine; if you do not find the parasite withhold the quinine. This is a good rule. It is a fortunate circumstance that hæmoglobinuria frequently kills the parasite in the circulation. If you look at preparations of blood made just before the appearance of hæmoglobinuric symptoms you will often find the malarial parasite; if you examine the blood of the same patient just after the appearance of the hæmoglobinuric symptoms you may find a very few parasites; and if you examine it a little later, say 12 hours after, you may fail to find any parasites at all. Apparently there is a process of natural cure caused by the parasite itself when it brings about hæmoglobinuria. That should encourage us to withhold quinine in many cases of blackwater fever, especially when the parasite cannot be detected by patient and competent observation with the microscope.

INSPECTION OF COWS TO DETECT TUBERCULOSIS.—The Dartford Urban Council, after communication with the urban district councils of Bexley, Erith, and Dartford Rural Council have jointly appointed for one year Mr. A. Edgar, F.R.C.V.S., on terms agreed upon, to undertake the duties of periodically inspecting cows in the respective districts under their control.

A Clinical Lecture

ON

MODERN METHODS OF AMPUTATING AT THE HIP-JOINT,

WITH A TABLE OF 15 CASES.

Delivered at the General Hospital, Birmingham, on March 1st, 1900,

BY THOMAS F. CHAVASSE, M.D., M.C. EDIN., F.R.C.S. EDIN. & ENG.,

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GENTLEMEN,—The patient here presented is rather an unusual case, for you will see that she has had both her lower limbs removed at the hip-joint. The clinical history is briefly this. Her age at present is 27 years and for some years she had suffered from tuberculous caries of the tarsal bones of the right foot, so that in October, 1895, it was necessary to perform a Symes's amputation at the ankle-joint. Some months later tuberculous osteitis manifested itself at the end of the tibia, and in October, 1896, Stephen Smith's amputation was performed at the knee joint. The stump never properly healed, and, becoming the site of another tuberculous deposit, she was re-admitted into hospital in May, 1897, and on the 29th of that month I removed the femur at the hip-joint. Healing was extremely protracted, and it was six months before the stump was sound. She was then lost sight of for some time, but she re-appeared at the hospital in April, 1899. The left foot and ankle were found to be much swollen and œdematous and there were signs of fluctuation on the outer side of the ankle-joint. On the lower third of the leg was a large tuberculous ulcer which had existed for three months; the knee-joint was filled with fluid and presented the usual symptoms of tuberculous disease. In the middle of the quadriceps extensor was a large caseating mass of the size of a clenched fist. The patient was emaciated and hectic. After a consultation with my colleague, Mr. Haslam, it was deemed desirable on April 20th to remove the left limb at the hip-joint. The healing of the stump was again protracted, but, as you now see, only two minute spots at the top of the external incision remain unhealed. The general health of the patient seems good, she has gained flesh and she takes her food and digests it well. At present there are no signs of any tuberculous deposit in any of the other joints of the body or in the internal organs.

I have now performed 15 amputations at the hip-joint upon 14 different individuals and herewith is presented in tabular form the sex and age of each patient, the disease for which the operation was undertaken, the plans adopted for restraining the hæmorrhage, the method of operating, and the results. On looking at the table you will see that in the series only two methods of operating have been practised. In the first anterior and posterior skin-flaps have been shaped from without inwards, and the muscles and vessels divided high up as close as possible to the pelvic bones by a circular incision. This method has been adopted in three cases (Cases 1, 2, and 9), each time with success, and theoretically it is the best method to be adopted when a malignant neoplasm has to be dealt with. Its drawbacks are that it undoubtedly increases somewhat the shock attendant upon the operation and the high division of the muscles necessitates the direct compression of the aorta for the restraint of hæmorrhage.

The second method is for practical purposes that known as the external racket operation and is really a combination of the vertical and circular incisions. The names of many eminent surgeons are associated with this plan of operation, notably, Furneaux Jordan, Lister, Esmarch, &c.; but I have preferred to speak of it as the external racket method as thereby the general principle of the operation is more likely to be impressed upon your minds than if it be associated with the name of any distinguished surgeon of the present or past generation. The precise steps will differ somewhat in a case in which the operation is undertaken for malignant disease from those taken when it is performed for the disease

of the hip joint. In the latter condition the lower the mass of muscles of the thigh are divided the less the shock to the patient, and the bone can be readily shelled out, subperiosteally or otherwise, especially when excision of the head has previously been performed, without interfering materially with the muscles on the inside of the thigh. For drawing special attention to these facts and demonstrating their utility in actual practice Mr. Furneaux Jordan, of this city, deserves all praise. In case of a malignant growth it is obvious that the further all the soft structures are divided from the growth the better are the prospects of success as far as recurrence in the stump is concerned. In such instances a circular incision may be made round the limb at about six inches from Poupart's ligament, merely dividing the skin and subcutaneous tissues; a vertical incision is then made commencing just above the great trochanter and carried downwards on the outer aspect of the limb until it meets the circular cut previously made. The skin is then reflected upwards all round as high as the lesser trochanter. At this point all the muscles and other soft parts are cut through by a circular incision reaching the bone, the femoral vessels are at once seized and ligatured, and steps are taken for the disarticulation of the head of the femur. For this purpose it is better to change the amputating knife for a large scalpel, as with this the joint is more readily entered, the ligamentum teres divided, and the head of the bone dislocated. A few cuts with the knife behind the head of the femur enable the removal of the limb to be completed. The remaining known vessels are then secured and the wound is closed in the usual manner as expeditiously as possible, after the tourniquet has been removed and any spouting arteries ligatured. It is better to drain the acetabulum either with a fair-sized drainage tube or with an iodoform gauze drain.

There is another method to which I should like to direct your attention and which might be especially serviceable when the operation is undertaken for an emergency and skilled assistance is not attainable. Personally I have had no experience of the operation, but it is described by Dr. W. L. Estes[1] as the "gradual dissection method" and is practically a modification of the German operation suggested by Professor Rose. The first step of the operation is the ligation of the common femoral vessels at Poupart's ligament and division of the same between double ligatures; short anterior and posterior skin flaps are then formed from without inwards, and the soft parts are divided by gradual dissection close up to the pelvis, all known vessels being secured before they are divided, the smaller ones being clipped immediately afterwards. It is at once apparent that the method takes more time for its accomplishment than the other plans, but it can be carried out with one assistant, who need not be a very highly trained one, and the surgical apparatus required is simple and slight.

The two main risks of the operation for amputating at the hip-joint to which I propose shortly to direct your attention are hæmorrhage and shock.

Hæmorrhage.—Many ingenious inventions have been introduced to obviate hæmorrhage, such as tourniquets, a rectal staff, clamps, &c.; but until a few years ago most practical surgeons relied mainly upon rapid execution and the dexterity of an assistant in digitally compressing the vessels before and after division. I may at once say that owing to a plan advocated by Professor Wyeth of New York City any fears as regards profuse hæmorrhage during this operation exist no longer. Professor Wyeth's idea is directed to the prevention of the slipping of the elastic tourniquet which is applied over the femoral vessels at the moment when the disarticulation of the limb is effected. This is accomplished by means of two steel skewers or pins, which have a head, and are rounded and sharp pointed at the other end, ten inches in length and three-sixteenths of an inch in diameter. They may seem rather formidable instruments at first sight, but for an adult in actual practice they are none too strongly made, as the strain upon them to keep the elastic tourniquet *in situ* during the necessary manipulations is severe. I show you two pins that I have used in three operations upon adults and you will perceive that they are considerably bent, this being accomplished by the tourniquet pressure. The elastic tourniquet employed should be half an inch in diameter and long enough to encircle the top of the thigh four or five times. In young children, however, a tourniquet of very much smaller calibre will suffice and instead of Wyeth's pins I employ two much smaller steel skewers such as a cook uses for trussing game or chickens for cooking purposes and which can be procured at any ironmongers, and I find that they answer very well. They are not, however, trustworthy for an adult, and on one occasion, when using them on a full-grown person, the outer one snapped off short and becoming useless had to be replaced in the middle of the operation. Fortunately the main vessels had been secured before the mishap occurred. The accompanying illustration will show the use of the pins. It is taken from Professor Wyeth's paper.[2] The outer needle is introduced a quarter of an inch below the anterior superior iliac spine and somewhat to its inner side, passing through the muscles to the outer side of the hip, and is made to emerge three or four inches from its point of entrance. Its direction should be a little backwards so as to keep it as far as possible from the great trochanter of the femur. The inner needle is inserted through the skin and the adductor longus muscle half an inch below the fork in the male and is brought out one inch in front of the tuberosity of the ischium. To protect the operator's hands a piece of cork is applied to the sharpened end of each needle as soon as it is in position. The limb is then emptied of its blood by elevation and the elastic tourniquet is wound tightly round the limb above the pins. Wyeth recommends that a compress four inches square and two inches thick be laid over the femoral vessels as they cross the brim of the pelvis before the tourniquet is applied. I have not, however, carried out this detail in any of my own cases. By applying the tourniquet effectively in the above manner hæmorrhage both from the anterior and posterior vessels is absolutely prevented, but the limb becomes very tense, and I have found that it takes a little more time to complete the disarticulation, as the free movements of the operator are somewhat hampered by the presence of the tourniquet and the pins, but this is quite a small matter as compared with the advantages obtained by immunity from bleeding. Before the pins and tourniquet are removed practically all the known arteries can be secured, and although there may be some general oozing subsequently it can be readily restrained by a good-sized flat sponge. On looking at the table you will see that eight cases out of the 15 have been treated in this manner and with, I think, such marked success that I have no hesitation in saying that at the present time it is the best method which we have at our disposal.

The second plan I have employed to restrain hæmorrhage is by directly compressing the abdominal aorta by placing a fair-sized pincushion or pad over it and protecting the spine and flanks of the patient with pads of lint, then encircling the abdomen with a thick elastic tourniquet. It is a very effective method, especially in children, but it is not so desirable in adults because the cushion is more apt to slip and the tight constriction necessary to stop the arterial circulation compresses also the intestines and may also embarrass the breathing of the patients. It has the advantage of not interfering in any way with the part to be operated on and permits the unimpeded formation of anterior and posterior skin flaps and the high division of the muscles attached to the pelvis, whilst the manipulations of the hip joint can be freely effected. It has been employed four times in the series (in Cases 1, 2, 4, and 9), and invariably with success as far as loss of blood is concerned.

The third method employed in the series is digital compression by a skilled assistant, and although in the three cases (Cases 3, 5, and 6) this has been carried out and the femoral vessels have been secured at an early stage of the operation, and I have also had the great advantage of the skilled fingers of my colleagues, yet I am bound to say that all three patients lost more blood during the operation than those subjected to the other two methods and that most of the blood so lost came from the vessels posterior to the joint.

Shock.—The shock will generally be severe, but its dangers can, I think, be reduced by certain routine observances. In the first place, the theatre or room in which the operation is conducted should be well warmed; 65°F. is a good temperature. Then a hot water table or a water bed filled with hot water for the patient to lie upon should be provided,

[1] Lehigh Valley Medical Magazine, January, 1894, and Philadelphia Polyclinic, March 24th, 1894.

[2] Annals of Surgery, vol. xxv., 1897.

and the extremities, excepting that to be removed, and the trunk should be enveloped in cotton-wool. The apparatus should be at hand for the intravenous injection of normal saline fluid and it is as well if the basilic vein of the arm on the opposite side to which the removal of the lower extremity is to be effected is dissected out by an assistant before the operator actually commences. I say on the opposite side because it is advisable to undertake the injection when the closure and dressing of the wound are being performed and the manipulations of the injector will thus not be impeded by the chief operator and his other assistant. I have now carried out the injection of saline fluid in my last eight cases and the effects have been so marked, and I believe so beneficial, that in my judgment it ought to form part of the routine of the operation in every case. One cannot say that it will invariably save life, still, it may be the means of tiding the patient over the most critical time and so allow the opportunity for the administration of liquid foods and the exhibition of other remedies.

The most prominent symptoms of the shock following the operation are cold clammy sweating of the body, cold extremities, extreme restlessness, small rapid pulse, and constant efforts at vomiting.

All the cases in the series, excepting Case 6, have been hospital cases, and in this class of patient it is often extremely difficult to make the patients or their friends realise the necessity for the removal of the limb. Cases 3, 10, and 13 are examples. Case 3 was that of a man, aged 32 years, who had had excision of the left femur performed and a large portion of his acetabulum removed for long-standing hip-disease. Osteitis of the shaft of the bone ensued and the amount of pus discharged daily was more than a pint, yet for more than nine months after he had been informed that it was impossible to save the limb he refused to have amputation performed. The patient in Case 10, a girl aged 14 years, had her hip-joint explored in June, 1896, and it was found that the acetabulum was perforated and the tuber ischii carious, yet her parents declined to have the major operation carried out until January, 1897. She recovered well from the shock of the operation but she gradually sank and died on the evening of the third day exhausted. In Case 13, that of a girl aged eight years, the head of the left femur was excised on Feb. 26th, 1897. By the beginning of 1898 the cicatrix broke down and disease of the acetabulum and shaft of the femur were detected, but the parents refused to have amputation performed for 14 months, by which time there was amyloid disease of the liver, the edge of the organ being readily detected below the ribs, and the urine contained albumin and waxy casts, besides being increased in quantity. When she was admitted into hospital in April, 1899, there were no fewer than 12 discharging sinuses round the hip-joint, the pus being of the most offensive description, yet after the operation the health of the child immediately began to improve, the size of her liver gradually diminished, the polyuria and albuminuria disappeared, and she is to-day alive and well, although in September last it was necessary to remove a loose piece of the pelvis and to scrape out several unhealed sinuses.[3]

Age is an important factor to be considered when a successful issue is sought for, and at one time I thought that in those patients much over 20 years of age who had to undergo this operation each added year of life increased the risk in a disproportionate degree. But the certain restraint of hæmorrhage and the injection of normal saline fluid before the patient is removed from the table has modified this idea. Eight of the patients in the tabulated cases were well over this age and of these six recovered. The oldest patient was 56 years of age, and he had been an inmate of the hospital in November, 1898, but then declined to undergo amputation. Nearly three months afterwards, when the sarcoma had increased very much in size, he was going upstairs at his own house and slipping on a step he felt his femur break in the situation of the neoplasm. This induced him to return to the hospital to have the limb removed and although convalescence was slow the stump was soundly healed in two months. Perhaps, therefore, we are justified in concluding that modern methods of performing the operation have considerably reduced the age mortality.

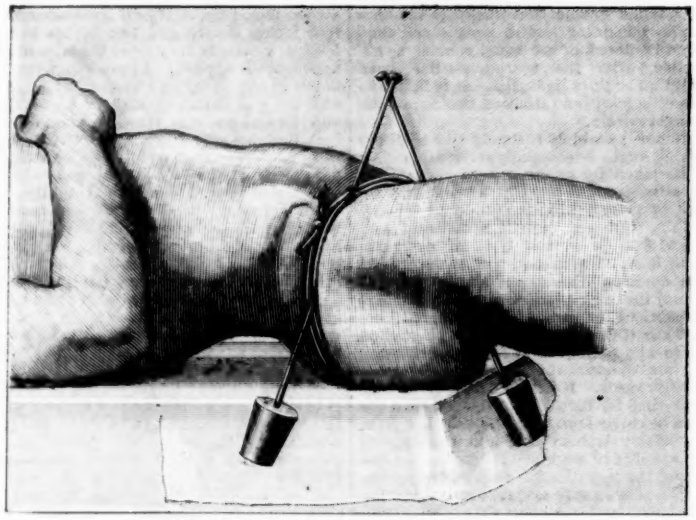

Illustration showing tourniquet and pins in position.

Pregnancy need not be considered to be a bar to the operation. In Case 8 the woman was 29 years of age and was six months pregnant, yet she bore the operation well and did not miscarry until a month afterwards, when the stump was practically healed. She survived the operation long enough to give birth to a healthy child after leaving the hospital. Case 15 was a woman, aged 23 years, whom I saw in the Rugeley Cottage Hospital with Mr. H. D. Chapman. She was over eight months pregnant with her first child and had a fungating sarcoma originating in the head of the tibia and implicating the right knee-joint and the belly of the semimembranosus muscle. We decided in consultation to induce premature labour and ten days later, a healthy living child having been born, the physical pain was so great that with the assistance of Mr. George Heaton and Mr. H. D. Chapman I thought it desirable to remove the entire

[3] The patient now (July, 1900) shows signs of caries of the second lumbar vertebra.

TABLE OF 15 CASES OF AMPUTATION AT THE HIP JOINT.

No.	Sex and age.	Date of operation.	Disease.	Restraint of hæmorrhage.	Operation.	Result.	Remarks.
1	F., 15 years.	June 3rd, 1882.	Periosteal sarcoma of the lower third of the left femur.	Compression of the abdominal aorta by pin-cushion and elastic tourniquet.	Anterior and posterior skin-flaps and circular division of the remaining soft parts close to the pelvis.	Healed in six weeks. Recurrence in the right lung and death in six months.	Recorded in Brit. Med. Jour., vol. i., 1884.
2	M., 5 years.	Oct. 13th, 1882.	Morbus coxæ with necrosis and fracture of the lower third of the right femur.	Compression of the abdominal aorta by pin-cushion and elastic tourniquet.	Anterior and posterior skin-flaps.	Healed by Dec. 3rd, 1882.	The patient is still alive. Recorded in Brit. Med. Jour., vol. i., 1884.
3	M., 32 years.	Feb. 27th, 1883.	Left morbus coxæ of long standing. Head of the femur and part of the acetabulum removed in 1882.	Digital compression of the common femoral artery.	External racket method.	Death from shock on March 1st.	Large white kidneys were found post mortem. Brit. Med. Jour., vol. i., 1884.
4	M., 5 years.	July 1st, 1890.	Right morbus coxæ.	Compression of the abdominal aorta by pin-cushion and elastic tourniquet.	External racket method (sub-periosteal).	Sent to a convalescent home on August 22nd.	The patient is still alive; anterior excision was performed on April 26th, 1890. The acetabulum was diseased.
5	M., 16 years.	Oct. 17th, 1890.	Left morbus coxæ.	Digital compression of the common femoral artery.	External racket method.	Death from shock nine hours afterwards.	The patient was much emaciated from prolonged suppuration. At various times he had spent many months in hospitals.
6	M., 26 years.	May 31st, 1892.	Purulent osteo-myelitis of the right femur.	Digital compression of the common femoral artery.	External racket method.	Healed by June 8th.	The lower third of the thigh was amputated by Carden's method in November, 1891, for ununited fracture through the head of the tibia affecting the knee-joint. The patient fell on the stump a month before the last operation. There was a family history of tuberculosis.
7	F., 39 years.	Feb. 20th, 1896.	Endosteal sarcoma of the lower third of the left femur.	Pin method (Wyeth).	External racket method.	Death from shock in 10 hours.	The patient had sustained a fracture of the lower third of the femur six months previously.
8	F., 29 years.	March 26th, 1896.	Endosteal sarcoma of the lower third of the right femur.	Pin method (Wyeth).	External racket method. Intravenous injection of 15 ounces of saline fluid.	Healed by June 5th. Died on May 25th, 1897, from recurrence in the left lung.	The patient was six months pregnant at the time of the operation. Abortion took place on April 26th. The fœtus was dead.
9	M., 10 years.	Nov. 13th, 1896.	Periosteal sarcoma of the lower third of the right femur implicating the knee-joint.	Compression of the abdominal aorta by pin-cushion and elastic tourniquet.	Anterior-posterior skin-flaps and circular division of the soft parts close to the pelvis. Intravenous injection of half a pint of saline fluid.	The wound healed in three weeks except a small sinus.	The patient was alive 18 months after the operation.
10	F., 14 years.	Jan. 1st, 1897.	Right morbus coxæ. The acetabulum was perforated and the tuber ischii was carious.	Pin method (Wyeth).	External racket method. Sub-periosteal enucleation. Intravenous injection of half a pint of saline fluid.	Death from exhaustion on Jan. 4th.	The joint had been explored in June, 1896, but amputation was delayed at the request of the relatives of the patient.
11	F., 24 years.	May 29th, 1897.	Tuberculous osteitis of the stump following amputation at the right knee-joint.	Pin method (Wyeth).	External racket method. Intravenous injection of one pint of saline fluid.	Healed.	Syme's amputation at the ankle-joint for tarsal caries was performed on Oct. 8th, 1895, and Stephen Smith's amputation at the knee-joint on Oct. 9th, 1896, for osteitis of the tibia.
12	M., 56 years.	Jan. 26th, 1899.	Periosteal sarcoma of the lower third of the left femur.	Pin method (Wyeth).	External racket method. Rectus muscle infiltrated with new growth and divided high up close to the acetabulum. Intravenous injection of saline fluid (one pint).	Healed by March 27th.	The patient fractured his femur when walking upstairs on Jan. 23rd, 1899.
13	F, 8 years.	April 6th, 1899.	Left morbus coxæ. (Amyloid degeneration of the liver and kidneys.)	Pin method (Wyeth).	External racket method; intravenous injection of saline fluid (half a pint).	Sent to a convalescent home on June 6th. Sequestrum removed from the pelvis on Sept. 14th, 1899.	The head of the bone was excised on Feb. 26th, 1897, and scraping was done on Oct. 30th, 1897. The parents refused amputation in December, 1897.
14	F., 26 years.	April 20th, 1899.	Tuberculous disease of the left knee-joint and ankle-joint; caseating mass infiltrating the anterior muscles of the thigh. Tuberculous ulcer of the middle third of the leg.	Pin method (Wyeth).	External racket method; intravenous injection of saline fluid (one pint).	Healed.	This was the same patient as in Case 11.
15	F., 23 years.	Nov. 19th, 1899.	Endosteal sarcoma of the head of the right tibia, implicating the knee-joint and infiltrating the belly of the semi-membranosus muscle.	Pin method (Wyeth).	External racket method. Saline fluid injected into the cellular tissue of the axilla (12 ounces).	Healed.	The patient was over eight months pregnant with her first child and premature labour was induced 10 days before operation. Convalescence was retarded by a mammary abcess.

lower extremity. Convalescence, as might be expected, was tedious and was also complicated by a mammary abscess, yet with care and good nursing the patient has at length made a satisfactory recovery.

Of the 15 tabulated operations performed on 14 patients 11 of the patients recovered and four died, a mortality of 26·6 per cent. These cases were taken just as they occurred in practice and there was no selection of patients. In six instances the operation was performed for sarcomatous growths (four women and two men) and of these one died from shock. In the remaining nine the removal of the limb was undertaken for bone disease. The malignant cases were: Case 1, periosteal origin, round-celled growth; Case 7, endosteal, mixed celled with a preponderance of round cells; Case 8, endosteal, round-celled; Case 9, periosteal, mixed celled with a preponderance of round cells; Case 12, periosteal, mixed celled (round and spindle cells about equally distributed); and Case 15, periosteal, mixed celled with a preponderance of round cells. In three of the fatal cases the cause of death was shock pure and simple (Cases 3, 5, and 7), and it was after the death of the patient in Case 7 that I began systematically to inject saline fluid at the conclusion of the operation and since then no patient has succumbed from this cause. The patient in Case 10 rallied well from the immediate effects of the operation and did not cause anxiety until the third day when she began to sink slowly without any assignable cause except that apparently she had no rallying power. You will note that in this case as well as in Cases 3 and 5 permission to amputate was not obtained until a long time after the patient and the friends had been warned that the limb must be sacrificed. In fact, in three out of the four fatalities this prolonged wait was, I believe, the factor that caused the operation to be unsuccessful. Yet it is not to be wondered at that patients or their friends procrastinate in these instances, for a surgeon will generally find that assent to perform an operation is obtained readily enough when a really good prospect of recovery can be promised, whilst waiting is preferred if only a *dernier ressort* can be offered.

The tables of Dr. Sheppard of Philadelphia published in Ashhurst's "International Encyclopædia of Surgery"[4] show that 245 cases undertaken in civil practice give a mortality of 41·1 per cent. Mr. Frederick Page[5] gives 16 cases in which the operation was undertaken for disease in the Royal Infirmary, Newcastle-on-Tyne, with 10 recoveries and six deaths—mortality of 37·5 per cent. Dr. John Erdmann[6] of New York, collecting the figures of eight hospitals in that city, shows 18 cases with eight deaths, or a mortality of 44·4 per cent., but it is quite possible and probable that cases operated upon by a variety of surgeons will show a larger mortality-rate than if one particular surgeon had had the entire experience. Hence Dr. Estes[7] in his own tables had seven cases with one death, or a mortality of 14·2 per cent. But the most remarkable and most successful number of cases that have yet been collected are those of Professor Wyeth[8] who has brought together 69 cases in which hæmorrhage has been restrained by the application of his pin method. Four of these were primary cases and cannot fairly be included in the series as test cases. Their exclusion reduces the number to 65 in which the operation was performed for disease, with eight deaths, a mortality of 12·3 per cent. Of these eight one died from pneumonia on the thirty-second day when the patient was getting about, and one from tuberculous peritonitis on the eleventh day. If these be omitted as not being directly attributable to the operation we have 63 cases and six deaths, a mortality of 9·5 per cent., and one of these was due to a preventable cause, septicæmia.

From these figures I think that we are justified in concluding that an improved modern technique of operating, which includes the antiseptic and aseptic methods, has reduced the mortality of a formidable procedure to such really small dimensions that in suitable cases there is no longer any actual excuse for procrastination and that we are justified in urging operation in cases in which up to now we have been content merely to recommend it. If we can do this the immediate mortality of the operation will in future be possibly reduced even below Wyeth's figures.

[4] Vol. i., 1882.
[5] THE LANCET, March 5th, 1892, p. 523.
[6] Annals of Surgery, vol. xxii., 1895.
[7] New York Medical Record, Nov. 3rd, 1894.
[8] Annals of Surgery, vol. xxv., 1897.

ON RUPTURE OF THE APPARENTLY HEALTHY ŒSOPHAGUS.[1]

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CASES of the above occurrence are rare—so rare that having lately observed one I have thought it well to collect the others which have been recorded and endeavour to present as accurate a picture as possible of this hitherto invariably fatal accident. The occurrence seems worthy of attention, not only on account of the interest attaching to its rarity and the peculiar and alarming symptoms with which it is attended, but also because the cases resemble each other so closely in previous history, signs, and symptoms that a correct diagnosis is quite within the bounds of possibility and modern advances in the surgery of the mediastinum seem to warrant a hope in the feasibility of successful intervention in some future case. I shall first detail particulars of a case under my own observation.

A man, aged 40 years (Case 17 in the table) was admitted to the Mater Misericordiæ Hospital at 1 P.M. on Nov. 18th, 1899, complaining of pain, not very intense, in the lower part of the chest and of swelling of the neck. His face was deeply cyanosed, he seemed to be gasping for breath, the pulse was quick and weak, and his general condition was somewhat collapsed. The neck and face were much swollen on both sides and palpation at once revealed the fact that the swelling was due to subcutaneous emphysema. His voice was low and hoarse and he spoke little and that with much difficulty. No treatment had any effect and the dyspnœa became more intense, the pulse weaker, and the emphysema meanwhile crept up to the eyelids and down the thorax. Death occurred at 8 P.M. His friends stated that he was of alcoholic habits and that he "had been more or less drunk every night for the last 20 years." He used to vomit every morning and was much given to "dry retching." On the evening before his death he had had tinned salmon for dinner and the following morning had retched worse than usual. Nevertheless he went to his work and whilst there noticed that his neck was swollen so that his collar became uncomfortably tight. His breathing became difficult and he felt a good deal of pain in the lower part of the chest. The exact period of onset of the symptoms could not, however, be certainly determined. At about noon he left his work and went home, whence his friends took him to the hospital.

Necropsy.—At the necropsy, which was performed by me 40 hours after death, the body was found to be that of a muscular middle-aged man. Post-mortem lividity was extensive and the features were almost obliterated from emphysema which extended from the eyelids to the mammary level. A brownish frothy fluid flowed from the mouth and nose. Post-mortem rigidity was well marked in the legs and elbow-joints, but was absent from the shoulders. On removing the sternum the cellular tissue of the anterior mediastinum was seen to be emphysematous. The left pleural cavity was partly obliterated by adhesions in front and behind it was filled with brown pultaceous fluid in which were bubbles of gas. The left lung was collapsed so far as the adherent pleura would allow and was almost solid with œdema. On removing the lung and sponging out the pleural cavity a slit-like aperture was seen at its lower and back part leading into the œsophagus. The right pleural cavity, almost obliterated by adhesions, contained a little brownish fluid, whilst the lung was covered behind with a layer of discoloured fibrinous exudate which felt greasy. It was intensely œdematous and almost airless. The pericardium contained four ounces of pink serum in which gas-bubbles appeared when the heart was raised up. These were seen detaching themselves from the point of entrance of the pulmonary vessels into the pericardium. The size and weight of the heart were normal, but it was very flabby; there were atheroma of the commencement of the aorta and some

[1] A paper read before the Pathological Section of the Royal Academy of Medicine in Ireland on May 4th, 1900.

fatty degeneration of the left ventricle was noticed. On removal of the heart and the lungs the whole contents of the mediastinum from the root of the neck to the diaphragm were seen coated with brown pultaceous material mingled with bubbles of gas. The matter was seen issuing from a slit-like aperture nearly 1·5 centimetres long in the anterior surface of the œsophagus immediately above the diaphragm. The opening was quite clean cut, with sharp edges from which a few small blood-clots projected—evidently thrombosed veins. The opening extended down quite to the level of the diaphragm and from its lower end a linear tear in the mucous membrane ran some distance into the cardia. There was no trace of ulceration and the wall of the gullet was fully as thick as normal. The wall of the gullet on each side of the rupture felt somewhat softened, but there was no discolouration of the mucous membrane. The mucosa of the stomach was, however, distinctly discoloured—blackened—with hæmorrhagic erosions at the cardiac end, and was streaked with dark lines corresponding to the veins. It was decidedly softer than normal, but could not be said to have been digested. It contained a good deal of brownish fluid identical with that found in the pleural cavities and mediastinum. The abdominal organs seemed healthy, except the liver, which was enlarged and fatty, but, contrary to expectation, not in the least cirrhotic. The omentum was much infiltrated with fat and the pelvis contained a few ounces of serum.

Morbid histology.—The specimen was dissected out and placed in 20 per cent. solution of formalin. The removal from the side of the rent of pieces of tissue comprising the entire thickness of the gullet wall could of course not be practised without materially injuring the macroscopic appearance of the specimen. This drawback was, however, the more readily put up with, because, so far as could be ascertained, no detailed microscopic examination of such a case had ever been published. Three pieces of tissue were therefore removed from different levels at one side of the laceration, comprising the edge of the actual rent and imbedded in paraffin, whilst a much larger piece, comprising a nearly complete transverse slice of the œsophagus, was taken from a point below the lower end of the rupture, so as to include the above-mentioned tear in the mucous membrane, and imbedded in celloidin. This gave the best results as the formalin fixation proved a little too "light" for the best class of paraffin work. 1. The *epithelium* at the level of the rupture was well preserved except on the top of the folds that projected into the lumen. In the crypt-like spaces between the folds it was particularly well preserved and the prickle-junctions of the cells were quite distinct; about 0·1 millimetre from the edge of the rupture it ceased quite suddenly. The tear above mentioned as prolonging the rupture proper down into the stomach was found to be in reality a deep groove between two projecting folds of mucous membrane. The sides of this fold were partly stripped of epithelium, and its floor was broken through so as to lead into a minute cavity in the sub-mucosa crammed with leucocytes and containing clusters of cocci. On the surface of the epithelium there were but few micro-organisms. 2. The *sub-epithelial tissue* near the rupture and below it was much damaged and had to some extent lost its staining power. It consisted for the most part of unstriped muscle in a markedly dissociated state, with a few compound racemose glands, and numerous veins which were strikingly large and for the most part collapsed and empty. Here and there, however, one was seen to contain an organised thrombus containing round mononuclear elements and fibroblasts. There was also diffuse leucocytic infiltration. 3. The muscular coats, longitudinal and circular, were quite thick and well developed. The individual bundles were somewhat loosely compacted, as though they had undergone partial dissociation. Towards the edge of the rupture their outlines became less distinct and faded away amidst masses of multifarious micro-organisms. In both the muscular layers were sinuous tracks crammed with polynuclear elements amongst which spherical and elongated masses of cocci were readily demonstrated in preparations stained by Gram's method (Czaplewski's modification), after previous treatment with lithiocarmine and differentiation in acidulated alcohol. In the bundles of circular muscle, which were of course divided longitudinally on the transverse section of the gullet, patches free from nuclei and presenting a hyaline-degenerate appearance, were here and there detected. 4. The outer fibrous coat contained adipose tissue in small amount, whilst a few nerve-fibres and an occasional ganglionic cell were seen. Its outer surface where it had been in contact with the extravasated gastric contents was quite necrotic and swarmed with various bacterial forms. The nuclei had lost their staining power. The inner part adjacent to the longitudinal muscle coat was in a state of intense leucocytic infiltration and contained numerous colonies of cocci. Other forms of bacteria were not seen. Here were also many large veins, most of them quite solidly thrombosed, the process being of recent date, as was evidenced by the outline of the red discs being still visible. Organisation was, however, in progress, as was evidenced by the presence of mononuclear elements and fibroblasts. Immediately outside these veins were numerous polynuclear leucocytes and cocci. The general impression produced by a study of these sections was that whilst the outside of the gullet and the sides of the rupture were gangrenous and swarmed with the multifarious organisms derived from the gastric contents with which they had been in contact, the deeper parts of the gullet wall were in a state of purulent inflammation owing to their invasion by pus-cocci. There was also a thrombo-phlebitis of the œsophageal veins which, however, could not have been septic in the first instance. Had it been so organisation would hardly have occurred. I cannot look upon either the thrombo-phlebitis or the purulent infiltration as having developed during the few hours that elapsed between the occurrence of rupture and the termination of life. The loss of epithelium and of staining-power and the dissociation of the submucous structures may be interpreted as evidence of a process of intra-vital digestion. Considering, however, the fact that 40 hours elapsed before the necropsy was made, it would not perhaps be justifiable to attribute these changes to other than post-mortem alteration.

PREVIOUS RECORDS.

In searching the records it is important to exclude cases in which the œsophagus has been perforated—(*a*) from within by foreign bodies, such as bones, false teeth, &c., or by bougies, probangs, and the like introduced for diagnostic or therapeutic purposes, or by ulceration,[2] malignant or otherwise; and (*b*) from without, by the erosion of aneurysms, adherent masses of caseous glands, tumours, and the like. The possibility of the occurrence of post-mortem digestion and of agonal œsophago-malacia has also to be borne in mind, and the appearances so produced carefully distinguished from the results of sudden rupture taking place *intra vitam*. Failure to appreciate this distinction is responsible for several erroneous records.[3] Eliminating these faulty observations, there remain 17 indubitable and more or less carefully observed cases of rupture of an apparently healthy gullet. In the appended table I have endeavoured to bring out the salient features of these 17 cases, so far as I have been able to collate them.

The first of these observations, and in some respects the most interesting, was made by the illustrious Boerhaave, who published a full account of it in Latin. His patient was the celebrated Dutch Admiral Baron Wassenaer, and the following is an abstract of Boerhaave's description, which from its fulness and scientific minuteness may well be looked upon as classical. (Case 1 in table.) The baron, a man about 50 years of age, moved in the best society of Holland, and was a diner-out and a large eater, though not a heavy drinker. After meals he used to feel a disagreeable sensation in the cardiac region of the stomach and obtained relief by the use of emetics. On the day of his attack, being in the best of health, the baron partook at his early dinner of the following substantial repast: Veal soup with herbs, boiled lamb with cabbage, fried sweetbread and spinach, a duck, two larks, and a compôte of apples. For dessert he had pears and grapes, followed by sweetmeats. His beverages were beer and moselle. Afterwards he went out riding and on his return, feeling uncomfortable in the epigastrium, he took three cups of hot *thistle tea* to induce vomiting; but with poor success. He then drank four cups more of the same decoction, and whilst straining violently in his efforts to vomit he was suddenly seized with a terrible pain and shrieked aloud so that his servants rushed to his assistance. He exclaimed that something had given way in his stomach and

[2] In excluding cases of ulcer it is important to remember that the mere solution of continuity due to rupture is liable to be described as an "ulcer." Compare the case of Lindemann and that of Lindsay and Lorrain-Smith.

[3] Kade: De Morbis Ventriculi, Halæ, 1798, p. 16. Guersent: Bulletin de la Faculté de Médecine de Paris, 1812, tome i., p. 73. Bouillaud: Archives Générales de Médecine, 1823, tome i., p. 531.

TABLE OF 17 CASES OF RUPTURE OF THE APPARENTLY HEALTHY ŒSOPHAGUS.

No. of case.	Sex and age.	Alcoholic.	Previous history.	Onset.	Symptoms.	Emphysema.	Duration of life in hours.	Shape and position of rupture.	Results as determined by necropsy.	Authority and date.
1	Male, over 50.	?	Gouty; heavy eater; accustomed to use emetics.	Sudden, whilst retching.	Felt something give way; intense pain; collapse; typical situs; dyspnœa.	Yes.	18	Complete transverse rent three fingers' breadth above the diaphragm.	Collapse of the lungs; air and gastric contents (104 oz.) in both pleural cavities.	Boerhaave,[1] 1724.
2	Male, ? age.	Yes.	"Debauch" the previous night.	Sudden, after drinking hot water to induce vomiting.	Felt something give way; slight hæmatemesis; severe pain; dyspnœa; collapse.	"	About 12	Longitudinal slit just above the diaphragm big enough to admit two fingers.	Double pneumothorax; gastric contents in both pleural cavities.	Dryden,[2] 1787.
3	Male, 24.	"	Severe epigastric pain and vomiting for several months.	Sudden, after public dinner, during vomiting.	Slight vomiting; severe epigastric pain; typical situs.	"	14	Large rent just above the diaphragm.	"Portions of food in the lower part of the chest."	Wilkinson King,[3] 1843.
4	Male, 38.	"	"Took lye when a child and since then food has stuck near pit of stomach."	Sudden, after attempting to swallow a sausage which became impacted and caused straining.	After striving to vomit, some hæmatemesis; pain; oppression; dyspnœa; typical situs.	"	50	Gaping rent one and a quarter inches long by three-eighths of an inch wide three inches above the cardia; edges sharply defined.	Gangrenous cavity in the posterior mediastinum; "exudation" in both pleural cavities.	Meyer,[4] 1858.
5	Male, 35.	"	Gastric disturbance six weeks previously when a bone was thought to have been swallowed.	Sudden, after carouse.	Vomiting at first, then pain; dyspnœa; collapse; typical situs.	"	11½	Longitudinal tear five centimetres long, encroaching on the stomach.	Double pneumothorax; six to eight ounces of reddish fluid containing solids and fat in each pleural cavity; gangrenous cavity in the mediastinum.	Gramatzki,[5] 1867.
6	Male, 49.	? Probably.	—	Sudden, after meal of ducks, green peas, and plum-pudding.	Felt something give way during vomiting; pain; dyspnœa; collapse; died asphyxiated.	"	16	Longitudinal slit one inch long just above the diaphragm.	Three quarts of fluid containing food in the left pleural cavity; lung collapsed.	Griffin,[6] 1869.
7	Male, 35.	Yes.	Drinking hard for several days before onset; from infancy had some dysphagia.	Sudden, after vomiting and whilst exercising a horse.	Felt something give way; pain; dyspnœa; intense thirst; collapse.	Not stated.	7½	Slit one and a half inches long in the left side of the lowest part of the gullet, extending further in the mucous than in the other coats; edges well defined above; irregular and softened below.	Gangrenous cavity in the posterior mediastinum opening into the left pleural cavity, which contained two quarts of fluid containing starch and oil; lung collapsed.	Charles,[7] 1870.
8	Male, 31.	"	Repeated attacks of gastritis; delirium tremens; hæmatemesis.	Sudden, during violent efforts to dislodge a piece of meat impacted in œsophagus.	Pain and dyspnœa, not very prominent at first; fever.	Yes.	180	Rent two inches long at the level of the bifurcation of the trachea.	Cavity in the right side of the posterior mediastinum crossed by fibrous bands and filled with clot; overlying pleura adherent.	Fitz,[8] 1877.
9	Male, 17.	No.	Attack of blood-poisoning a short time previously.	Sudden, during vomiting.	Hæmatemesis; intense feeling of suffocation; pain; collapse.	Stated to have been present before date of rupture; but?	4	Rent 1·5 centimetres long at one inch above the cardia.	Opened into the left pleural cavity, which contained gastric contents.	Taendler,[9] 1878.
10	Male, 53.	"	Dyspeptic for many years with occasional vomiting.	Sudden, after feeling unwell for two hours after dinner.	Severe pain in the left side and shoulder; collapse.	Not stated.	7	In posterior wall of the gullet one and a half inches long just above the diaphragm; through the mucous and submucous coats only above.	—	Adams,[10] 1878.

TABLE OF 17 CASES OF RUPTURE OF THE APPARENTLY HEALTHY ŒSOPHAGUS—(*Continued*).

No. of case.	Sex and age.	Alcoholic.	Previous history.	Onset.	Symptoms.	Emphysema.	Duration of life in hours.	Shape and position of rupture.	Results as determined by necropsy.	Authority and date.
11	Male, 48.	?	Chronic gastric ulcer.	Sudden.	Vomiting, followed by pain and collapse.	No.	15	"Ulcer" two centimetres long by one centimetre wide in the posterior wall of the gullet two centimetres above the cardia and a little to the right; edges thickened, somewhat funnel-shaped.	Double pneumothorax; food in both pleural cavities; infiltration of the posterior mediastinum with gastric contents.	Lindemann,[11] 1887.
12	Male, 52.	No.	"Good eater; drank little."	Sudden attack of nausea causing the patient to tickle the fauces with his finger; during retching agonising pain and sensation of something having given way.	Pain; collapse; cyanosis.	Yes.	"A few."	Clean tear one centimetre long just above the cardia.	Left pleural cavity full of gas and food.	Wolff,[12] 1894.
13	Male, 47.	No.	Vomiting; dyspeptic.	Sudden, whilst vomiting.	Pain; collapse; dyspnœa; voice higher pitched than usual; disappearance of cardiac dulness.	Yes.	13½	Sharply defined rent one and a half inches long immediately above the cardia.	Left pneumothorax; in each pleural cavity was a pint of grumous fluid like gastric contents.	Harrison,[13] 1893.
14	Male, 59.	Yes.	Drinking hard for a week previously to admission.	Sudden.	Pain; dyspnœa; effusion into the left pleural cavity.	Yes.	37	Sharply defined "ulcer" one and a half inches long two inches above the cardia, involving the mucous membrane only below.	Accumulation in the posterior mediastinum, bursting into the lung but not communicating with the pleural cavity; gas in the mediastinum; acute pleurisy on both sides.	Lindsay and Lorrain Smith,[14] 1899.
15	Male, 43.	?	"Quite healthy."	Sudden; illness and vomiting after eating.	Collapse.	?	6	Rent two centimetres long in the gullet six centimetres above the cardia.	Food in the left pleural cavity.	Heintze,[15] 1900.
16	Female, 62.	No.	?	Sudden, after vomiting induced by salt and water.	Intense epigastric pain aggravated by swallowing; dyspnœa; collapse.	Yes.	22½	Rent five-eighths of an inch long one and a half inches above the diaphragm.	Lower part of the gullet was much softened; brownish fluid in the posterior mediastinum and the left pleural cavity; collapse of the left lung.	Bowles and Turner,[16] 1900.
17	Male, 40.	Yes.	"Drunk every night for 20 years;" much addicted to retching.	Sudden, probably during retching.	Pain not the most prominent symptom; intense dyspnœa; cyanosis; collapse.	Yes.	About 10	Slit-like rent 1·5 centimetres long in the anterior surface of the gullet just above the diaphragm, prolonged into the stomach by a fissure in the mucosa.	Contents of the stomach in the posterior mediastinum and the left pleural cavity; collapse of the left lung; acute pleurisy of the back of the right lung; gas in the mediastinum and the pericardium.	McWeeney, 1900.

[1] Atrocis nec descripti prius Morbi Historia secundum medicæ Artis Leges Conscripta, Lugd. Batav., 1724.

[2] Medical Commentaries, Edinburgh, 1788, Dec. ii., vol. iii., p. 308.

[3] Guy's Hospital Reports, 1843, second series, vol. i., p. 113.

[4] Medicinische Vereinszeitung in Preussen, 1858, No. 39, No. 40, and No. 41.

[5] Ueber die Rupturen der Speiseröhre, Inaugural Dissertation, Königsberg, 1867.

[6] THE LANCET, Sept. 4th, 1869, p. 337.

[7] Dublin Quarterly Journal of Medical Science, 1870, vol. i., p. 311 gives literature).

[8] American Journal of the Medical Sciences, 1877, p. 17 (gives literature).

[9] Deutsche Zeitschrift für praktische Medicin, 1878, No. 52.

[10] Transactions of the Pathological Society of London, vol. xxix., p. 113.

[11] Münchener Medicinische Wochenschrift, 1887, No. 26.

[12] Medical News, 1894, No. 19.

[13] THE LANCET, April 8th, 1894, p. 784.

[14] Lindsay: Transactions of the Royal Academy of Medicine in Ireland, 1899, vol. xvii., p. 53.

[15] Freie Vereinigung der Chirurgen Berlins, Sitzung vom 12 Feb., 1900, abstracted in the Medicinische Woche, 1900, No. 7, p. 63.

[16] Brit. Med. Jour., 1900, vol. i., p. 763.

that he felt sure he must die at once. In a cold perspiration and ghastly pale he was taken to bed and the nearest medical man was sent for who resorted to friction with warm cloths, administration of mucilaginous drinks, olive oil, and poultices. There was no more vomiting and everything taken was retained. Boerhaave, who then came on the scene, found the patient complaining only of an intense pain in the epigastrium much increased by eructation and by movements of the spinal column. He was sitting up in bed with his body bent forward almost doubled in two. There was no nausea, no difficulty in swallowing, no hiccough, and no abdominal tenderness. The patient's mind was quite clear, and he assured Boerhaave that some change must have taken place in the position of parts within the chest. Diagnosis was impossible, and the measures resorted to—hot fomentations, venesection, &c.—were unavailing to give the slightest relief. Very little urine was passed despite the large amount of fluids swallowed. After a night of the most intense agony, dyspnœa began to come on; the pulse began to fail about 3 o'clock in the following afternoon, and death supervened at 5 o'clock. 24 hours afterwards Boerhaave made the necropsy. He found extensive subcutaneous emphysema, the heart normal, and both lungs collapsed. The pleural cavities contained 104 ounces of fluid, consisting for the most part of what had been taken by the patient during the last hours of life. The material smelt of roast duck. On the pleura covering the œsophagus was a flabby blackish spot about three inches in diameter in the centre of which was a rent one and a half inches long by about a third of an inch wide, from which fluid similar to that in the pleural cavities could be squeezed, and which communicated with the lumen of the gullet. This was found to have been ruptured and the two ends retracted in opposite directions. The most careful examination failed to reveal the existence of any ulcerative or other morbid process in the coats of the gullet which appeared quite healthy. The stomach and intestines were distended with gas but otherwise normal.

This case recorded by Boerhaave is unique in presenting a complete transverse division of the gullet. Its rapid course and severe symptoms are in harmony with what is usually observed. Fitz's case (Case 8 in the table), on the other hand, lasted no less than seven and a half days, and as the observation has been very carefully and fully recorded by its author, who was at that time assistant professor of pathology at Harvard, it may properly be abstracted in this place. The patient, a merchant, aged 31 years, was in a debilitated condition from over-indulgence in alcohol, and suffered from gastritis and hæmatemesis. For years he was in the habit of cutting his food into small pieces, and he ate slowly, but never complained of pain or difficulty in swallowing. Whilst at supper a morsel of food lodged in his gullet, and it was only after an hour of great discomfort that he succeeded in ejecting the substance, which proved to be a piece of gristly meat nearly circular in shape, about an inch in length and rather more than half an inch in diameter. It came from his mouth with noise and force as if propelled from a popgun; he sank back exhausted and ejected a moderate quantity of clotted and liquid blood. A swelling was then noticed at the angle of the lower jaw on each side (emphysema). In the subsequent progress of the case but little pain was complained of till the sixth day, when it became sharp and excruciating and was accompanied by tonic spasms of the flexor muscles of the limbs. Swallowing and vomiting could both be quite well performed. Respiration was likewise not interfered with until the last day of life. Emphysema was extremely pronounced; the whole subcutaneous tissue of the body appeared to be undergoing a process of inflation. The face, the eyelids, the upper part of the chest in front, and the entire back were swollen; the scrotum was enormously distended and the inflation extended to the middle of the thighs. At the necropsy Dr. Fitz found the anterior mediastinum to be emphysematous, independently of the conditions produced on removal of the sternum. The left pleural cavity was obliterated by old adhesions which were emphysematous and the costal pleura contained numerous bullæ distended with air. The lungs were œdematous and the lower lobes were moderately collapsed. In front and to the right, at and below the bifurcation of the trachea was found a longitudinal rupture of the œsophagus two inches in length extending through all its coats. Its edges were sharply defined and gave no evidence microscopically or otherwise of a pre-existing ulcerative or degenerative process. A communication was thus established between the œsophagus and mediastinum in all directions and behind the former to a limited extent. This cavity was of the volume of a small lemon, was crossed by fibrous trabeculæ, and was filled with clotted blood. Its walls, neither soft nor pulpy, were of greenish hue, and the thickened and reddened left pneumogastric nerve could be seen projecting behind. The tissues of the posterior mediastinum on the left side were spongy and stained with blood. The pleura covering the cavity mentioned on the right side was adherent to the opposed upper lobe of the lung, the adhesions being recent, discoloured, and offensive. The inner surface of the œsophagus, from the bifurcation of the trachea to the cardiac orifice of the stomach, was of a greenish colour. Its epithelium was slightly flocculent, occasionally thickened in patches, and was entirely absent over a space an inch in diameter below the rent, the exposed surface being smooth and shining; its walls were of normal consistence. The appearances presented by the stomach were those of chronic gastritis and there was no indication of post-mortem softening.

To the cases of undoubted rupture of the œsophagus (17 in number) which have been sufficiently recorded for inclusion in the table, there must be added, as almost certainly belonging to this category yet not recounted in sufficient detail for tabulation, the cases of Williams[4] (1848), Oppolzer[5] (1851), Bailey[6] (1873), and Heyfelder.[7] A case recorded as rupture of the œsophagus by Colegrove,[8] the account of which is not accessible to me, seems to have escaped the notice of Fitz, who, writing in America, might have been expected to have come across it in his review of the literature.

The subject has been discussed and the literature up to date collected by my friend and colleague on the examining board of the Royal University, Professor Charles of Queen's College, Cork, in 1870. This was in connexion with a study of the case that came under his own notice. In 1877 Fitz published the case above abstracted, which was under the care of Dr. Adams of Baltimore. Fitz also took occasion to collect the literature up to date and discussed it very ably, though I cannot agree with him in his exclusion of several records which appear to me to be genuine cases of intra-vital rupture, such as those of Boerhaave (Case 1 in table), Dryden (Case 2), King (Case 3), and Charles (Case 7). Dr. John Knott of Dublin has also treated of the subject in a very admirable way in an "Essay on the Pathology of the Œsophagus," which gained the gold medal of the Dublin Pathological Society at the close of the session of 1877. There is, further, a full notice of the accident and a discussion of its distinction from agonal and post-mortem œsophago-malacia in Zenker and von Ziemssen's "Cyclopædia of Medicine."[9] Finally, Sir Morell Mackenzie has dealt with the subject in his work on "Diseases of the Nose and Throat," and extended our knowledge by a series of experiments the outcome of which I shall return to later.

A number of cases described or quoted as examples of this condition prove on examination to be examples of agonal or post-mortem œsophago-malacia. Details of such up to 1877 will be found in the work of Fitz and that of Zenker and von Ziemssen, and references to some of these have already been given here. In collating the records I have considered it necessary to eliminate two cases published by Stanley Boyd.[10] One was that of a child, aged four months, who had been suffering from high fever and quick pulse, with an erysipelatous rash. Difficulty in breathing came on two hours before death. There was no emphysema. At the necropsy an aperture two millimetres in diameter was found midway between the bifurcation of the trachea and the cardia. For a short distance above and below it the circular muscle fibres were exposed between two separated longitudinal bands. Except for several narrow clots about an inch long, lying in furrows between the longitudinal folds, no morbid change was detected in the

[4] Transactions of the Pathological Society of London, 1848, vol. i., p. 151.

[5] Wiener Medicinische Wochenschrift, 1851, p. 65. (The patient in this case was presumably a female who strained herself during ironing.)

[6] New York Medical Journal, May 1873. (The patient in this case was a robust negro. There was a longitudinal rent three-quarters of an inch long one inch above the cardia. He lived 24 hours. ? emphysema.)

[7] Sanitätsbericht ueber das Fürstenthum Hohenzollern-Sigmaringen, 1837. (The patient was a male drunkard. There was a very large rent of the size of a threepenny piece close to the cardia.)

[8] Buffalo Medical Journal, 1849 and 1850.

[9] English edition, 1878, p. 90, et seq.

[10] Transactions of the Pathological Society of London, vol. xxxiii., p. 123.

gullet. At the necropsy extravasation of gastric contents is not mentioned. The left pleural cavity was normal; the right contained an ounce of bloody fluid; the lungs were not collapsed. The committee (Dr. J. F. Goodhart and Mr. H. T. Butlin) to which the specimen was referred reported on it as a case of "gastric solution," and from the age of the patient, her previous illness, and the absence of emphysema and of extravasation of gastric contents, I have little doubt that the case was an example of agonal œsophagomalacia.

Boyd's second case was that of a girl, aged 18 years, who was the subject of Addison's disease and who had suffered from persistent vomiting for several months. There was no sudden pain, no pneumothorax, no emphysema, and no dyspnœa. At the necropsy there was a longitudinal rent five centimetres long in the left side of the œsophagus immediately above the cardia; part of the overlying pleura had disappeared, and "this must have been due to digestion." The stomach showed some deep circular erosions and black lines marking the course of the vessels. The same committee reported on this specimen also and found that "the mucous membrane at the level of the opening was dark and thickened as if from pre-existing disease, but the slit-like character of the opening and an uneven furrow between the longitudinal rugæ parallel to it are suggestive of gastric solution. But it seems probable that the œsophagus had been weakened by pre-existing disease and gastric solution, or both together, and had given way during the last few hours of life, and we think the specimen may serve to call attention to the occurrence of gastric solution during the enfeeblement immediately preceding death—an occurrence which is probably not very uncommon, which has never yet been adequately described, and which has produced within our knowledge most puzzling appearances." These reports manifestly place the cases in question outside the category of spontaneous rupture of the apparently healthy œsophagus. On the other hand one meets with cases described under the name of ulcer which undoubtedly belong to the category now under notice. Lindemann's (Case 11 in table) is one of these, and the case reported by Professor J. A. Lindsay and Professor Lorrain Smith (Case 14) is another. To the courtesy of Dr. Lorrain Smith I am indebted for an opportunity of examining the specimen, which is preserved in the pathological collection at the Queen's College, Belfast, and have been able to convince myself that it is of a similar nature to my own. A solution of continuity in the wall of any tubular viscus is by many pathologists termed an "ulcer," especially when gaping of the sides of the rent suggests loss of substance.

GENERAL FEATURES OF THE CASES.

Sex.—Of the 17 cases 16 were those of men: one of the non-tabulated cases (Oppolzer's) was that of a woman.

Age.—The subjects were mostly men in the prime of life, the average age of those of whom it is recorded being 42 years.

Alcoholism.—This seems to be a pre-disposing cause, and in eight of the 17 cases there is a distinct history of excessive drinking.

Vomiting.—In eight of the cases this was of frequent occurrence, whether the result of excessive eating or drinking or induced by emetics. It is, however, as an exciting cause that vomiting is especially prominent in connexion with rupture of the œsophagus, for in every one of the cases tabulated the accident seems to have occurred either during vomiting or whilst the patient was straining to accomplish the act (retching).

Symptoms.—In a number of the cases there was a distinct feeling that something had given way within, and in all there was pain, usually of the most agonising character, speedily followed by collapse and nearly always associated with dyspnœa. The position adopted by the sufferer was characteristic—sitting up with the trunk stooped forward as much as possible. The pain was usually aggravated by swallowing and sometimes by eructation. The most striking of all the symptoms and one of the most constant is emphysema. It appears first in the neck spreading up to the face, causing more or less obliteration of the features, and downwards over the trunk, reaching to the scrotum and thighs. The symptom was present in 12 of the cases and probably in several of the others, but the records of some of these are imperfect [Adams (Case 10 in table), Taendler (Case 9), and Heintze (Case 15] These characters make up an extremely well-marked and very unusual clinical picture, which, once seen, is indelibly imprinted on the recollection.

Duration of life.—Fitz's case (Case 8 in table) survived by far the longest—seven and a half days. The other 15 cases in which the duration is stated lasted on an average only 17 hours.

Position and shape of rupture.—In all the cases save that of Fitz, the opening was immediately above the diaphragm, and was often prolonged upwards or downwards by a sort of fissure in the mucous membrane. This feature was especially well marked in my case. Save in the case of Boerhaave (Case 1 in table) the shape of the rupture was a longitudinal slit opening usually into the left pleural cavity, sometimes into both, occasionally (Lindsay and Lorrain Smith, Case 14 in table) into neither.

Etiology.—Charles in his very able paper[11] considers that "the rupture followed softening which may have resulted from chronic inflammation of the stomach and lower third of the œsophagus. The continued ingestion of alcohol probably induced a chronic gastritis or gastro enteritis, the inflammation involving also the lower third of the œsophagus. Softening of the mucous membrane occurred as a consequence. ..... Immediately preceding or accompanying the vomiting there may have been temporary spasm of this tube resembling the 'hour-glass' contraction of the uterus, and under these circumstances the contents would be impelled against its parietes close to the cardiac orifice." This view is practically identical with that subsequently adopted by Zenker and von Ziemssen. Fitz[12] considers that "two factors are essential—the impaction of a foreign body in the œsophagus and the exercise of great muscular force in the attempts to remove it." This opinion is manifestly incorrect, inasmuch as the factors in question were present only in two of the cases—that of Meyer (Case 4 in table) and his own.

A much better grounded opinion is that of Zenker and von Ziemssen[13] who look upon rupture as the consequence of a digestive softening of the œsophagus occurring *intra vitam* in persons who are quite well otherwise. They lay down the following conditions as pre-requisite for the production of the softening: (1) regurgitation of stomach contents rich in pepsin and acid; (2) protracted retention of regurgitated food in the œsophagus; and (3) cessation or great weakness of the circulation. The first of these conditions occurs when the stomach is over-distended, or in association with attempts at vomiting. The protracted retention would be realised if there were diminished muscular energy in the œsophagus such as might readily be occasioned by the exhaustion due to continuous and violent vomiting. The local circulatory disturbance is harder to account for. Zenker and von Ziemssen think that the œsophagus, on account of its much less abundant blood-supply, is proportionally less protected against the gastric juice than the stomach, and, as regards the nature of the disturbance the authors reject infarction and embolism, curiously enough omitting to mention thrombosis, which, in view of the frequency of varicose veins in the lower part of the gullet, seems the most probable cause. They speak of a "spastic ischæmia" and conclude as follows: "And hence, accepting Andral's witty remark that in consequence of varied emotions the stomach, quite as well as the skin, may now turn pale and now be suffused, we shall certainly ask whether the striking pallor of the face and lips during vomiting does not extend to the stomach and œsophagus. This ischæmia may not ordinarily extend to a degree where the tissues would be exposed to the action of the gastric juice, but an unwonted increase in the same would open the door for a catastrophe. After all we have said we hold that the view is well founded that all cases of spontaneous rupture of the œsophagus may be referred to an intra-vital œsophago-malacia."

Mackenzie considers that the immediate cause of rupture is vomiting, and that "vomiting only causes rupture when the contents of the stomach cannot be expelled through the gullet at the same rate that they leave the viscus. ..... It is probable that some temporary obstruction near the upper end of the gullet preventing the flow of fluid matters from the stomach is the essential feature in rupture." He then points out that "to determine the cause of this obstruction is not always possible. In two cases, as already remarked, a foreign body was impacted in the œsophagus, but these were

[11] Loc. cit. [12] Loc. cit. p. 34.
[13] Loc. cit., vol. viii., p. 106.

exceptions. In all the others the obstruction, if present, must have been due to something inherent in the tube itself. This is probably to be found in strong contraction of the circular fibres of the gullet at the upper part of the œsophagus. In two cases—those of Fitz (Case 8 in table), and of Wilkinson King (Case 3)—there was tetanic spasm, affecting in the one the flexors of the limbs and in the other the abdominal muscles; and it need hardly be pointed out that if such a condition existed at the same time in the muscular walls of the gullet rupture would be likely to take place." In writing the above Mackenzie must have forgotten that the cramp did not come on till long after the occurrence of the rupture—on the seventh day of the illness in Fitz's case, and after the onset of pain and dyspnœa in that of Wilkinson King. Mackenzie endeavoured to found his view on a basis of experiment by testing a number of normal gullets removed post mortem in order to find out at what point and in what manner they underwent rupture when overstrained by excessive pressure from within. He concluded (1) that rupture by direct pressure applied within the œsophagus always takes place in a longitudinal direction; (2) that the rent never occurs in the upper part of the tube and in most cases is confined to the lower third; and (3) that the mucous membrane offers greater resistance to strain than the muscular covering.

Before dismissing from our attention the valuable work of Mackenzie on this subject, it is only right to say that, in rejecting the auto-digestion theory of Zenker and von Ziemssen, he has quite failed to grasp the exact nature of their position. He quotes them as considering that the accident results chiefly from "intra-mortem œsophageal malacia," or softening of the coats from peptic solution in the last hours of life. But the German authors distinctly lay down[14] "that œsophago-malacia may be developed in rare cases *intra vitam* in a patient who is perfectly well, without any connexion with any preceding serious disease, and form the basis of the so-called spontaneous rupture of the œsophagus."

That intra-vital digestion is not the sole cause is clearly proved by the uniformly longitudinal form of the aperture and its sharply-defined edges—characters which are just the opposite of those met with in gastro-malacia. That pressure from within cannot be the sole cause is, I think, evident from the exceeding rarity of the accident despite the frequency with which the œsophagus is distended by relatively enormous foreign bodies.

The conclusion to which I have arrived as the result of a careful study of existing data is, that the two main factors that are operative in causing rupture of the macroscopically normal gullet are (*a*) softening of the coats and (*b*) sudden increase of pressure from within. The softening is due partly to intra-vital digestion, and partly (at least in the case which I observed) to inflammatory infiltration. The intra-vital digestion is to be accounted for by (*a*) circulatory disturbance, which in my case took the form of venous thrombosis, and (*b*) prolonged sojourn of peptic matters in the gullet from prolonged retching. The increased pressure from within is doubtless ascribable to the violent propulsion of the gastric contents into the lower part of the gullet whilst its upper outlet is obstructed by the contracted state of the muscle—in other words to want of coördination of the muscular action of the tube, probably due to exhaustion from prolonged over-activity. Whether a localised phlegmonous œsophagitis—for that is the condition which existed in the case now recorded—is a constant factor in these cases, it is of course impossible to assert in the absence of microscopical details of the other cases. I believe I may lay claim to be the first to establish the existence of this condition as a possible cause of rupture of the apparently healthy gullet.

Dublin.

[14] Loc. cit., p. 105.

BATH MINERAL WATER HOSPITAL.—At the meeting of the committee of this institution held last week it was decided to make alterations and improvements in the hospital at a cost of upwards of £5000. Our commissioner's strictures seem to have had a good effect.

THE Professor of Physiology in Tübingen, Dr. Willy Kühne, who died last month, left directions that his body was to be cremated and that during the process the first movement of Beethoven's Ninth Symphony was to be performed; also that no memorial festival should be held.

A CASE OF PERNICIOUS ANÆMIA FOLLOWING ON TRAUMATIC STRICTURE OF THE SMALL INTESTINE.

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(With Pathological Report by W. Hunter, M.D.)

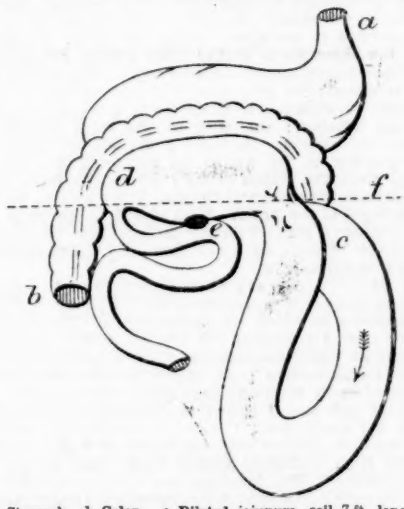
A CAREFUL perusal of Dr. William Hunter's most suggestive essays on pernicious anæmia has convinced me that the following case ought to be put on record. I do not feel competent to pronounce on the general questions which this writer so ably raises, but the case appears to me to lend strong support to his views as far as it goes. It has also some points of intrinsic surgical interest and especially the effect of cart-wheel accidents upon the intestine short of actual rupture. The notes and observations on the blood, &c., were accurately kept by my house surgeon, Dr. F. H. Thiele, whose abstract of them forms the basis of this record. Dr. Hunter has also kindly added a report on his study of specimens obtained at the post-mortem examination which adds great interest to the case.

A man, aged 28 years, a sawyer, was admitted into University College Hospital on Feb. 5th, 1900. He had always enjoyed good health until seven years ago when he was run over by a loaded wagon. The two near wheels, which were broad, passed over the lower part of the thorax, breaking, it is stated, five ribs and splintering another. This was followed by "pleurisy and inflammation." He was ill for 14 weeks, and after this began to have the attacks now complained of. There was no history of syphilis, rheumatic fever, or tumours, but the patient had always suffered from "heartburn," which had been worse since the accident. The patient had always been quite temperate. He had been well fed and had lived among healthy surroundings.

On admission he was noted as being very well nourished, inclining to fat, but extremely anæmic. This was most marked in the conjunctivæ, lips, and finger-nails. An examination of the abdomen revealed no abnormality of the internal organs and only a slight tenderness and increased resistance midway between the right iliac spine and the navel. Nothing unusual could be felt from or in the rectum. His reason for seeking treatment now was extreme weakness and anæmia with periodic attacks of pain and vomiting which set in soon after the accident seven years ago. These had occurred at intervals of from a week to a month and lasted from a week to a fortnight. During these attacks pain and swelling began about two inches to the right and below the umbilicus and spread from there all over the abdomen. At the same time the patient had vomiting and diarrhœa. The vomit consisted of food and green fluid which tasted bitter and sour. The motions during these attacks were much lighter in colour than usual, and sometimes very pale indeed. The pain was much relieved by change of posture in any direction. The great pallor was first noticed in the summer of 1899, and since September, 1899, the patient had suffered from shortness of breath on exertion accompanied by palpitations. During and after September, 1899, the patient was prevented from working for about 10 weeks by vomiting and diarrhœa. On admission the temperature was 99·4° F. and the pulse was 112. This was about the average for nearly a week, when the fever slightly increased to about 100° or a little over this. He then (Feb. 17th) had the first attack of pain since admission. It began at the point described and spread all over the abdomen, lasting about one and a half hours. He vomited at this time both food and bile, and had a loose stool without any undigested food or fat and not offensive. Dr. Thiele's analysis of the blood showed red corpuscles 2,000,000, white 54,000, and hæmoglobin 30 per cent. The optic discs were now examined and were found to be normal. On Feb. 16th the stomach was washed out, but showed nothing abnormal. On the 17th a hæmorrhage was noticed in the left eye above and to the outer side of the optic disc. Pain and vomiting occurred on the previous night. The vomited matter was bile-stained with very little undigested food. It contained free hydrochloric acid. Reduced iron was now

given. The diet was full and was eaten with appetite except in the morning. The patient was growing paler. On the 21st he vomited twice with but little pain. The urine had been free from albumin since admission. It was acid and of normal colour with an excess of indican. Urea 2·5 per cent. There had been no loss of flesh, but the pallor was increasing very much and severe headache had been complained of for some days. On the same day (the 21st) an examination of the blood showed red corpuscles 1,000,000, hæmoglobin 20 per cent., and white corpuscles 1 : 450. The blood itself to the naked eye was very thin and watery; megalocytes and microcytes, but no nucleated red corpuscles, were seen. Feeling now satisfied that there was some serious lesion high up in the small bowel, probably of the nature of a stricture, I decided to explore the abdomen.

Operation was performed on Feb. 22nd. The abdomen was opened in the mid-line above the umbilicus. The first thing noticed was a coil of enormously distended and thickened small intestine of white colour, which for the moment was taken to be the stomach. It was seen, however, on nearer inspection to lie below the colon, but to overlap it above. The distension terminated to the right of the spine in a sharp kink among many old smooth adhesions,



a, Stomach. *b*, Colon. *c*, Dilated jejunum, coil 7 ft. long. *d*, Dilated jejunum above stricture. *e*, Anastomosis between dilated and healthy jejunum. *f*, Obvious course of cart-wheel.

and below this the intestine was normal and empty. On pushing the finger into the distended coil so as to invaginate it a narrow stricture could be felt at the kinked spot. To the left the dilated coil was held down to the spine by adhesions which led me to the conclusion that I was dealing with the first part of the jejunum as it emerged from under the plica. These adhesions, too, were all smooth and evidently old. I now anastomosed the distended loop with the empty portion below the kink and stricture. This was done by a double row of silk sutures in the usual way. In making the openings in the contiguous loops the contrast between the thick-walled upper portion and the thin-walled normal viscus below was very striking. The abdomen was now closed in with silk sutures. The operation lasted 50 minutes and towards the end the condition of the patient was not very good. On this account a pint of normal saline solution was injected hypodermically during its concluding stages. After the operation there was a good deal of pain which was relieved by morphia, after which the patient fell asleep. The pulse was 116, the temperature was 102·2°, and the respiration was 38. The next morning he was not so well. The temperature was 102·8° and the pulse was 136. Death took place at 5.15 on the 24th.

The condition of things at the post-mortem examination was most instructive. The anastomosis left nothing to be desired as to water-tightness. Union was sound as tested in various ways and there was no peritonitis. The point of anastomosis lay in front of the spine nearly in the middle line. It united an enormously distended and thick-walled loop of small intestine with an empty coil lying below it. The cause of the distension was seen to be a tight stricture of the gut lying just to the right of the spinal column below the transverse colon, where the small intestine was kinked on itself as well. This kink was glued to the spinal column by many adhesions of old date. To the left of the spine the dilated coil was similarly held down by adhesions close to the termination of the duodenum. This had given the wrong impression at the operation that the distended coil was the first foot or so of the jejunum as it emerged from under the fold containing the mesenteric artery. On further examination now it was seen that the point glued by adhesions to the spine corresponded to a spot about seven feet below the commencement of the jejunum and that the whole of the left side of the abdomen was filled by a very much dilated and thick-walled coil of the latter some seven feet long. This coil was distended to about the size of an adult forearm with pale yellow fluid which was only escaping slowly through the anastomosis into the healthy bowel below (*vide* diagram). The crushing injury from the cart-wheel had also caused adhesions between the transverse colon and adjacent small intestine and had destroyed the upper end of the right kidney which was converted into a fibrous mass. The second part of the duodenum had also been damaged by the wheel. Its serous coat had been cracked in places, leaving the muscular coat exposed. These patches were glazed over and healed but stood out clearly against the normal bowel. The cracks reminded one of what is seen in cases of intussusception where the serous coat gives way, but I had never before had an opportunity of seeing such a crack healed. It was seen in this case that such a lesion could be repaired without the muscular coat adhering to any surrounding organ. The liver as tested by Dr. W. Hunter, who was present, contained a large excess of iron. On opening the distended bowel the stricture was found to be due to the contraction of an ulcer produced by the crushing of the mucous membrane where the cartwheel caught it against the spine. It was annular and the lumen was only about the size of a cedar pencil. Other healed ulcers were seen above it and some partially healed. The seven feet of bowel between the stricture and the duodenum were enormously dilated and full of pale yellow fluid like thin custard. This was taken away by Dr. Hunter for analysis. On examining the mouth and nose the ethmoidal sinuses were found to be full of pus. In all these factors the conditions were present which Dr. Hunter believes to be at the root of pernicious anæmia—suppuration connected with the mouth, a stricture of the intestine retaining the contents long enough to ensure their decomposition, and the formation of a specific poison.

The cause of death was probably the escape of the poison through the anastomosis and its rapid absorption by the previously healthy and empty intestine as indicated by high temperature and rapid pulse. One can only regret that no opportunity had been given for the performance of the same operation some months earlier before the patient had become so profoundly overcome by the disease.

Pathological Report.

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I am indebted to Mr. Barker for the opportunity of seeing the case above described, which has proved to be one of especial interest in relation to the pathology of pernicious anæmia. I only saw the patient a few hours before his death when he was too ill to be thoroughly examined. Nevertheless, from the account of his illness, his appearance, the degree of oligocythæmia (far greater than any ever caused by ordinary malnutrition or wasting disease however profound), and the character of his gastro-intestinal symptoms, I regarded the case as one of pernicious anæmia. This view was fully confirmed by the result of the necropsy, and still further by the subsequent investigation, both microscopic and chemical, which, thanks to Mr. Barker's courtesy, I was enabled to make on the material obtained from the case.

Nature of examination.—I was afforded the opportunity of being present at the necropsy, and I append the notes which I then made. I have subsequently examined microscopically the following tissues and organs—viz., blood, spleen, lymph

glands (gastric and mesenteric), liver, kidney, tongue, gums, teeth, stomach, small intestine, and colon; also chemically the liver, spleen, and kidney for iron; and, lastly, both microscopically and chemically the stomach contents. The number of sections so far microscopically examined has been close on 200.

Summary of results.—1. There were characteristic pigment changes with large excess of iron in the liver and kidney and intensely deep colour of bile denoting excessive hæmolysis. 2. The ordinary blood changes of pernicious anæmia, including the presence of nucleated red corpuscles in the blood, spleen, and glands. 3. Dental decay and necrosis with pus sacs at the roots of the teeth, collection of pus in the ethmoidal sinuses, and foul granulations around a necrotic tooth. 4. Stomach: fatty infiltration, degeneration, catarrh, and desquamation of the glandular cells; presence of cocci (oxyntic cells least affected) in the perivascular lymphatics of the submucosa at certain parts. 5. Intestine: there were no post-mortem changes. There were a number of ulcers in various stages (active, healing, and healed) above the constricted portion of the gut. At other parts there was thinning of the mucosa; the cells of the glands generally were normal; at parts there was superficial inflammatory necrosis of the mucosa due to the presence of organisms, at others replacement of glands by cicatricial tissue amidst which streptococcal organisms were numerous, and at others the presence of cocci in the perivascular lymphatics of the submucosa. 6. Colon: there were no post-mortem changes. The lymphoid elements of the mucosa were well preserved and staining was normal. (*a*) There was intense degeneration and necrosis of the glandular cells, hardly a normal cell remaining. The cells represented by granular detritus were crowded with organisms, most of them cocci, only a few bacilli; (*b*) cocci, both single and in chains, were very abundant in the deeper parts of the mucosa around the base of the glands (they were absent from the superficial mucosa) and at parts they were very numerous in the lymphatics of the submucosa. Their streptococcal nature in parts was very obvious. 7. Pus of ethmoidal sinus: "Staphylococcus pyogenes aureus and bacillus coli communis, the latter being probably a post-mortem contamination" (Dr. Eyre, Bacteriologist, Charing-cross Hospital). 8. Stomach contents: chemically there was neither free hydrochloric acid nor butyric acid. Lactic acid was present. Microscopically there were numerous organisms, including mouth bacilli. All of them were decolourised by Gram's method with the exception of a streptococcus form (streptococcus longus). The contents were deeply bile-stained, resembling closely in appearance and character the contents of the jejunum. No cultures were obtainable owing to excess of formalin. 9. The percentage of iron in the liver was 0·360; in the spleen, 0·069; and in the kidney, 0·330. To show the notable increase of iron in the liver and kidney I append for purposes of comparison the results of a similar analysis recently made in a case of gastric cancer—a case which resembled pernicious anæmia in the high degree of lemon colour and in the absence of any notable emaciation. Percentage of iron in the liver, spleen, and kideny in the gastric cancer: liver, 0·022; spleen, 0·013; and kidney 0·003.

Necropsy.—The necropsy was performed 12 or 15 hours after death. The weather was cold. There were no post-mortem changes. The body was fairly nourished. The blood was watery. The liver weighed 4 lb. 10 oz. and was fatty; the centre of the lobules was pale and the periphery was rust-coloured. A piece of liver placed in sulphide of ammonium gave marked iron reaction (blackening). The gall-bladder was filled with extremely deep golden-yellow-coloured bile. The mucosa was normal. As to the kidney, the right weighed four and a half ounces and showed a cicatrix at the lower end, the result of an old crush. The left weighed seven ounces. It was comparatively enlarged. The spleen weighed five ounces; it was red and firm, not soft. The stomach contained 120 cubic centimetres of bile-stained contents with food. There was no cadaveric softening. The mucosa showed punctiform hæmorrhages; there was considerable increase of mucus. The duodenum and intestine contents were fluid and very deeply bile-stained. The jejunum was much dilated and the walls were considerably hypertrophied above the point of narrowing (from six to seven feet below the stomach). The mucosa above the stricture showed a number of irregular ulcers, some of them cicatricial, others partially healed, and others still showing hyperæmic edges. Elsewhere the mucosa of the intestine, colon, and rectum showed nothing obviously abnormal. In the gastric and mesenteric glands there was no trace of hæmorrhages. Microscopically there was no pigment. The heart muscle was red and hyaline; there was no tabby-cat striation. The musculi papillares of the left ventricle were hypertrophied. There were a few punctiform hæmorrhages under the epicardium. The tongue was very soft on the sides; there were no ulcers. There were compound papillæ on the back part of the dorsum in front of the epiglottis slightly red and prominent. The tonsils were red. The œsophagus was normal in appearance. With regard to the teeth the incisors and canines were small, regular, and pearly white, looking quite normal. The bicuspids and molars were very bad, represented for the most part by necrotic atrophied-looking stumps, the gums around which presented a peculiar whitish sodden appearance. In the right upper jaw the first bicuspid was represented by a black stump, very small and atrophied (10 millimetres long by five millimetres wide), with a small abscess sac of about the size of a pea at its apex. The fang at the apex was dead and necrosed. The second bicuspid and first molar were represented by black fangs, the second molar had a black carious cavity in the crown, and the third molar a dark carious cavity on the outer side of the crown. In the jaw beneath these teeth was a large abscess sac 13 millimetres in diameter communicating by a fistulous sinus with the root of the second bicuspid or first molar above; bare bone was felt at the upper end of the sinus. In the left upper jaw there was a similar white sodden appearance of gums immediately around decayed roots. The wisdom tooth alone remained; the gum around it was swollen and at the back part was detached from the tooth. It was red, granulating, and inflamed; the fang of the tooth beneath was exposed and carious. On opening the left orbital cavity a large quantity of pus welled up, appearing at first as if coming from the orbital cavity; afterwards it was found to come from the ethmoidal sinuses. There were no subdural hæmorrhages in the brain. With regard to the lungs there were subpleural, punctiform hæmorrhages near the base. In the marrow of the long bones there was transformation of yellow into red marrow.

Remarks.—The case as a whole appears to me to support in a striking manner the conclusions which I put forward in the recent studies to which Mr. Barker refers. These observations denoted, I concluded, the infective nature of the condition termed pernicious anæmia, "the infection being confined to the alimentary tract, chiefly the stomach, no part of that tract from mouth to anus being safe from it." The source of infection I traced to the mouth, arising either within the mouth itself "in connexion with long-continued and neglected cario-necrotic conditions of teeth, sometimes possibly from stomatitis arising from other causes—e.g., drain poisons." The infection was "chiefly streptococcal, probably deriving its special (i.e. hæmolytic) characters from being of a 'mixed' character, the infection the more readily occurring if the stomach or intestine were already from any cause the seat of disease."

The anæmia was not due to any mere disturbances of nutrition arising from the stomatitis, glossitis, or any conditions of gastritis or enteritis which might be, and often were, found, but to the destruction of blood occasioned by the special infection. The whole group of conditions in the alimentary tract "were the local lesions of an infection, chiefly cæcal, the anæmia being the result of the destructive action of the poisons absorbed into the blood." Mr. Barker's case appears to me to present points of special interest in relation to the foregoing conclusions.

1. *Nature of the anæmia.*—That the case was one of pernicious anæmia is, I consider, conclusively established by the results of chemical analysis, showing a characteristic increase in the percentage of iron in the liver (also in the kidney). Microscopically the pigment was found within the liver cells in the outer zone of the hepatic lobule, with characteristic fatty changes in the centre of the lobule. The anæmia was thus hæmolytic in its nature.

2. *Mode of development.*—The patient suffered from more or less abdominal discomfort from the time of his accident seven years before without the development of any special degree of anæmia till the previous summer—i.e., seven months—before his death. His great pallor then became noticeable and he soon after began to suffer from shortness of breath and palpitation—i.e., five months before death. The conclusion which I form, then, is that at the time of his death he was in his first year of illness from pernicious anæmia. In his case the unhealthy conditions

of some part or other of the alimentary canal which according to my studies always precede and are necessary to successful infection, were created in the intestine above the point of stricture. As shown by the character and severity of his gastro-intestinal symptoms (pain and vomiting) these unhealthy conditions had existed from the time of his accident seven years before and it is, I consider, exceedingly probable that some of the healed ulcers found post-mortem above the seat of stricture were remains of lesions resulting therefrom. With comparative suddenness there was superadded to his general abdominal discomfort the feature of intense pallor with all the symptoms—e.g., palpitation, breathlessness, diarrhœa, and vomiting, varying febrile attacks (see Mr. Barker's account of the illness in September, 1899)—which are so characteristic of pernicious anæmia, and from that time forward what troubled him most—what he sought admission into hospital for—was his extreme weakness and anæmia complicated by periodical attacks of pain and vomiting connected with his intestinal condition. This relation of events—a history of antecedent gastric or intestinal trouble extending usually over many years, more or less suddenly followed by a rapidly developing anæmia out of all proportion to the actual extent or severity of lesion existing in the stomach or intestine—I find in my experience of the disease to be the typical mode of development of pernicious anæmia. And this more or less suddenness of development, with the extraordinarily high degree of anæmia (exceeding anything ever met with even in the severest forms of wasting anæmia) are the clinical features which I have come to regard as denoting the supervention of a new factor—viz., successful infection of some part or other of the alimentary canal.

3. *Evidences of infection.*—In the present case the evidences of infection of the mucosa, to a slight extent of the stomach and to a still greater extent of the intestine and colon were undoubted—notably (1) the small areas of the superficial ulceration and necrosis with inflammatory changes in certain parts of the mucosa of the small intestine, with presence of organisms confined to these areas and to the lymphatics of the submucosa; and (2) the very striking degeneration and necrosis of the cells of the tubules in the colon associated with presence of organisms also confined to the tubules and to the subjacent lymphatics of the mucosa and submucosa.

That the invasion of the mucosa was no mere post-mortem phenomenon is, I consider, clear from the following: (*a*) In the case of the stomach only in one part microscoped was there slight superficial post-mortem change in the mucosa, and at this point no organisms at all were found. On the other hand, the organisms were found in the lymphatics of the mucosa at prolated parts where no post-mortem changes were shown. (*b*) In the case of the small intestine the cells of the tubules generally showed no change and no organisms were present in them. On the other hand, where the organisms were present they were surrounded by evidences of inflammatory reaction—viz., nuclear fragmentation and necrosis. (*c*) In the case of the colon the organisms were confined to the degenerated and necrosed cells of the glands and to the lymphatics underlying them. They were not present amidst the lymphoid tissue of the general mucosa.

4. *Nature of infection.*—As regards the nature of the organisms present and their relative importance any decision from their microscopical characters alone is naturally impossible. The contents of stomach and intestine were much alike in character and both were bile-stained, so that it is certain that the ordinary intestinal organisms (bacillus coli) were present in the stomach no less than in the intestine. In the mucosa, and especially within the lymphatics, however, the organisms present were not bacilli but cocci, and especially streptococci (Zeiss, $\frac{1}{12}$ oil immersion), and a streptococcus was also present in the stomach contents. As this organism is undoubtedly pathogenic I am disposed to attach to it the chief importance. The infection of the mucosa was chiefly coccal and streptococcal.

5. *Source of infection.*—On this point—the one to which my recent observations more especially referred—no information was forthcoming from the history of the patient. He was too ill to be questioned. He had been well fed and had lived among healthy surroundings. With regard to any dental or oral trouble his wife informed me in reply to inquiry that he had not suffered in that respect. The examination, cursory in character, which I made at the time I saw him a few hours before his death, when he was already sinking, seemed to bear out this statement, for the front teeth which he showed me on opening his mouth seemed exceptionally good and healthy, so much so that I mentally registered the case as one affording no support to the recent conclusions regarding the prevalence of decayed teeth and their importance as a possible source of pyogenic infection in pernicious anæmia.

As it turns out, I cannot but regard the case as a most remarkable one in this relation, for I found at the necropsy that the front teeth were the only good ones. The remainder were for the most part represented by black roots lying in sodden white gums. At the roots of these, in one side of the jaw alone, were two abscess sacs, the larger being of the size of a small hazel nut. Moreover, on opening the left orbital cavity pus welled out in quantity from the ethmoidal sinuses. Of this condition of mouth or nose there was not, be it noted, the slightest suspicion during life and not the slightest symptom. This was one of the points to which I drew special attention in the observations recently recorded. I considered it "all-important in all cases of commencing anæmia that special attention should be directed to the condition of the teeth ..... by removal not only of old stumps, but also of all black teeth, and of teeth showing commencing cario-necrosis ..... these precautionary measures being necessary, irrespective of any statements made by the patient as to the degree of discomfort his teeth are causing. For in no single case observed, however bad I found the teeth to be, was my attention drawn to the teeth by the patient or any complaint made of them by him. There is a stage in pyogenic conditions as in other forms of infection when local reaction—e.g., pain or inflammation—is absent or insignificant at the very time when the general septic effects are most marked."

The case just recorded bears out—if possible even more fully than I had anticipated—the correctness of these statements. Without occasioning the slightest local discomfort there existed a profoundly septic condition both of jaw and ethmoidal sinuses. How long these decayed teeth had existed I have no means of knowing. But I note with interest the statement in his history that "he had always suffered from 'heartburn' worse since the accident," a symptom denoting existence of chronic gastric catarrh. The close relationship between dental cario-necrosis and gastric catarrh is the point which I have recently had occasion to elucidate. The two conditions are precisely those most favourable to infection of the mucosa of the stomach, and ultimately, if the conditions be favourable, as in the present case, to infection of the intestine lower down. For on the one hand there is diminished resistance on the part of the stomach from the diminished acidity of gastric secretion consequent on the catarrh; while on the other hand there is increase of dose from continuous swallowing of pus organisms from the necrotic teeth. In the present case both these conditions were met. The patient had infection of the mouth, and the gastric contents contained no free hydrochloric acid.

SUMMARY.

The relations of events in the case I would then summarise as follows:—

1. A man, temperate, well fed, and living in healthy surroundings.
2. Bad teeth causing alternately alveolar and ethmoidal suppuration without at any time occasioning local discomfort.
3. Always suffered from "heartburn" (denoting chronic gastric catarrh with diminished acidity of gastric juice).
4. Accident causing stricture of jejunum.
5. More or less severe abdominal and gastric symptoms lasting six years.
6. More or less rapid supervention of the features of pernicious anæmia nine months before death.
7. Post mortem (1) dental decay with local complications—e.g., alveolar and ethmoidal suppuration; and (2) definite infection (coccal and streptococcal) of the mucosa of the intestine and colon, with definite catarrhal, inflammatory, and necrotic changes—to a less extent of the stomach.

THE LATE MR. J. FLINT SOUTH, F.R.C.S.—Mrs. C. Stuart Andreae and Miss Mary F. South have forwarded to the treasurer of St. Thomas's Hospital a donation of £1000 to endow, in perpetuity, the "South Bed, as a memorial of the late Mr. J. F. South, who was for some years surgeon to that institution."

A CASE OF ULCERATIVE ENDOCARDITIS, WITH RECOVERY UNDER THE USE OF ANTI-STREPTOCOCCIC SERUM.

BY J. MICHELL CLARKE, M.A., M.D. CANTAB., F.R.C.P. LOND.,

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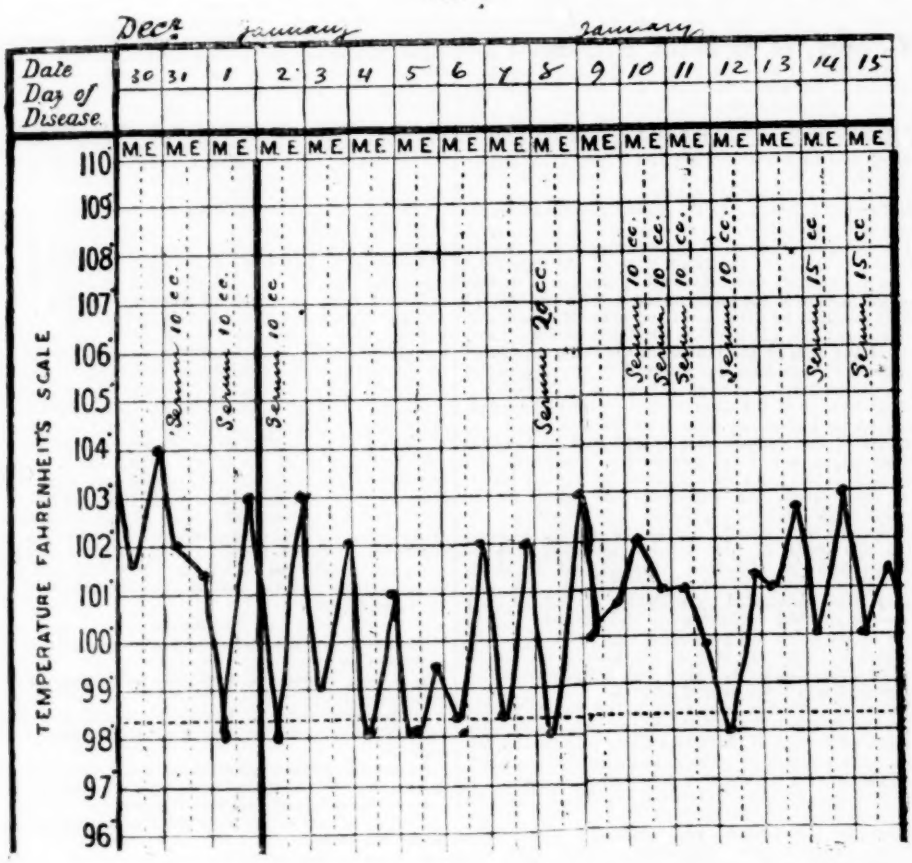
As the employment of anti-streptococcic serum in ulcerative endocarditis is still on its trial I have thought it worth while to report the following case in which it was successfully used. The patient was a single woman, 22 years of age. She had enjoyed good health until the age of 18 years, when she had what was called an attack of muscular rheumatism which laid her up in bed for six weeks. She then improved and was able to get about for two weeks, but developed pleurisy with effusion on the left side. She recovered from this and subsequently remained fairly well, but was delicate and liable to suffer from cough and from shortness of breath on exertion. She came to me on Nov. 14th, 1899, complaining of weakness, shortness of breath, pain in the præcordial region, and slight swelling of the ankles. She also said that during the previous fortnight she had felt hot in bed at night and had had two attacks of slight shivering accompanied by blueness of the lips and pallor of the face. She was tall, thin, and anæmic. The temperature was normal and the pulse was 110 and weak. The lower part of the left side of the chest was slightly contracted as a result of the attack of pleurisy. The heart's apex gave a forcible impulse in the nipple line in the left fifth space; dulness extended transversely from the nipple line to the right border of the sternum and upwards into the second left intercostal space; and a loud systolic murmur was present at the apex and right base and was audible at the angle of the left scapula. The liver was slightly enlarged. The urine contained no albumin.

The patient was kept in bed; the temperature rose two or three times in the evening to 100° or 101° F., and she appeared to be doing well, when on Dec. 6th she had a rigor and the temperature rose to 103°. On the 7th a small patch of broncho-pneumonia developed just below the angle of the right scapula and she expectorated a little blood-stained sputum. In the light of the subsequent progress of the illness this attack was probably due to an infarct into the lung. The temperature remained at from 102° to 103° for three or four days and then fell to normal and remained so for about a week when it began to rise again in an irregular fashion. The subsequent course of the temperature was as follows from the 19th to the 28th, 1899, inclusive:—

FIG. 1.

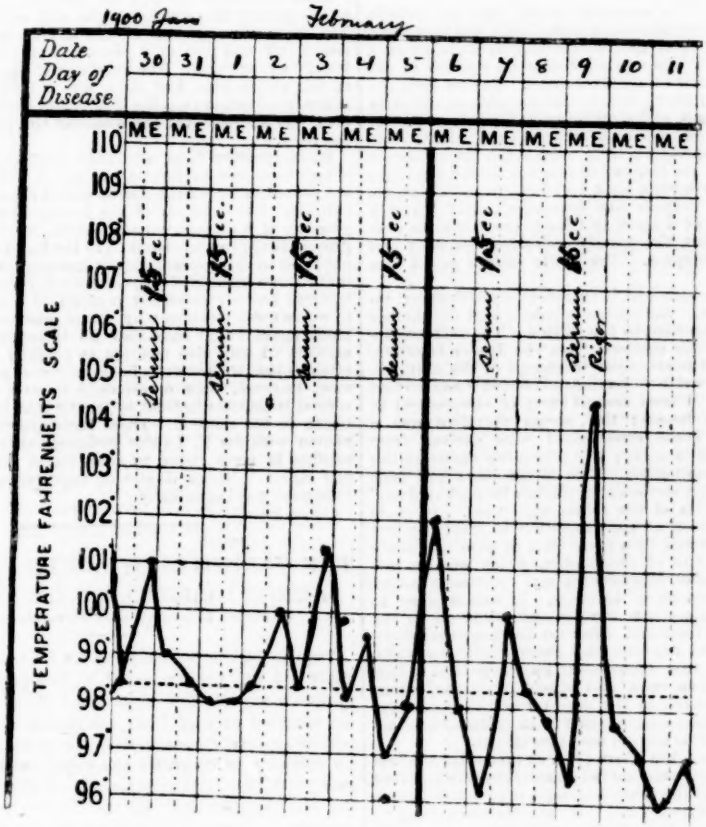


Date.	Morning.	Evening.	Date.	Morning.	Evening.
Dec. 19th ...	— ...	102·0° F.	Dec. 24th ...	97·0° F. ...	104·0° F.
,, 20th ...	98·0° F. ...	102·6°	,, 25th ...	98·0° ...	103·0°
,, 21st ...	97·4° ...	102·0°	,, 26th ...	99·0° ...	101·6°
,, 22nd ...	96·8° ...	103·0°	,, 27th ...	97·0° ...	101·4°
,, 23rd ...	97·6° ...	102·6°	,, 28th ...	98·0° ...	100·0°

From the 29th to Jan. 15th, 1900, inclusive, the course of the temperature is shown in the accompanying chart (Fig. 1).

On Dec. 23rd the patient felt weak and she was anæmic; there was a peculiar deep-red, at times almost livid, flush on the cheeks. No spots were seen, no hæmorrhages occurred, she took food well, and there was no vomiting or headache. Except for a few râles at the bases the lungs were normal. The heart's apex was forcible and slapping in the nipple line; there were dulness, some bulging, and forcible pulsation in the second and third intercostal spaces close to the left border of the sternum. In addition to a systolic murmur at the apex a loud systolic murmur had appeared over the pulmonary area and a faint diastolic murmur at the right base. The pulse was 120, weak, and collapsing in character; the respirations were 26 to the minute. The edge of the liver could be felt and the spleen was not enlarged. There was no weak; the pulse was 96, weak, and collapsing; the respirations were 24. 40 ounces of urine were passed, of specific gravity 1022; it was acid and was loaded with urates, but was free from albumin. The appetite was poor; there were no spots and there was no headache or sickness; the cheeks were still deeply flushed. There was no cyanosis; the veins in the neck were rather full. The heart's apex was now half an inch outside the nipple line; dulness extended upwards to the second rib and one inch beyond the right border of the sternum. The systolic murmur was now loudest in the second left intercostal space and less distinct at the apex and the aortic area. The to-and-fro systolic and diastolic murmur was still audible over the sternum; this murmur varied much in intensity from day to day, sometimes being loud and at other times almost inaudible. A systolic murmur was now generally audible to the right of the sternum in the fourth and fifth spaces. All the murmurs showed much variation on different days. The course of the

FIG. 2.



albuminuria. On Dec. 28th and again on the 31st a hypodermic syringeful of blood was withdrawn from the median basilic vein. Dr. D. S. Davies kindly undertook the bacteriological examination of the specimens, which proved to be free from micro-organisms. On the 31st treatment with anti-streptococcic serum was begun. Previously to this the patient had been treated with full doses of sodium salicylate, salicin, and salol, but without any effect on the irregular rises of temperature. On Jan. 6th, 1900, the systolic and diastolic murmurs at the base resembled a friction sound; the latter, however, was conducted down the left sternal border and was audible over the ensiform cartilage. Dr. Shingleton Smith saw her with me about this time and he agreed in the diagnosis of ulcerative endocarditis. On Jan. 12th the patient seemed

temperature from Jan. 16th to Jan. 29th inclusive was a follows:—

Date.	Morning.	Evening.	Date.	Morning.	Even
Jan. 16th ...	99·8° F. ...	103·0° F.	Jan. 23rd ...	98·4° F. ...	99·8° F.
,, 17th ...	97·0° ...	100·8°	,, 24th ...	98·0° ...	100·2°
,, 18th ...	98·4° ...	101·0°	,, 25th ...	98·0° ...	101·0°
,, 19th ...	98·4° ...	100·2°	,, 26th ...	98·0° ...	101·0°
,, 20th ...	98·4° ...	101·4°	,, 27th ...	98·0° ...	101·6°
,, 21st ...	98·0° ...	102·0°	,, 28th ...	97·0° ...	101·0°
,, 22nd ...	97·8° ...	101·4°	,, 29th ...	99·6° ...	101·4

On Jan. 21st the heart sounds at the apex had an approach to a galloping rhythm with a double second sound.

From about Jan. 20th the patient began to improve; she gained strength and was cheerful and anxious to get up; her colour improved and the flush left her cheeks, her appetite returned, and her temperature took a lower level. The pulse varied from 84 to 96 and the respiration rate was 22. From Jan. 28th she was carefully lifted on to a couch for some hours each day. From Jan. 30th to Feb. 11th inclusive the course of the temperature is shown in the accompanying chart (Fig. 2). On Feb. 3rd the chief murmur was a soft to-and-fro systolic and diastolic murmur at the base, loudest over the pulmonary area. No thrill was ever felt over any part of the area of cardiac dulness. The lungs were normal. She improved all through February, the temperature remaining subnormal after Feb. 9th. By Feb. 21st the cardiac dulness was much diminished in size; it still extended to half an inch outside the nipple line to the left, but above it stopped at the upper border of the third costal cartilage, and to the right it did not go beyond the right border of the sternum. The diastolic murmur had disappeared and there was only a long churning or grinding systolic murmur, loudest at the left base.

After this time it is sufficient to say that the patient steadily improved. On account of anæmia she was now given 10 minims of tincture of perchloride of iron three times a day. On March 4th she was allowed to walk about in her room and on the 11th to walk downstairs. On the 18th she was able to walk upstairs and downstairs without difficulty or shortness of breath, and after being up the greater part of the day there was no œdema of the ankles at night. The temperature was generally a little subnormal, the pulse-rate was 84 and regular, the respiration rate was 20, and the lungs were normal. The heart's apex had returned to the nipple line, the area of dulness had diminished, and the only murmur present was a quiet systolic murmur loudest over the aortic orifice, but also plainly audible at the apex and angle of the left scapula. The aortic second sound was accentuated.

The catamenia, which had been absent since October, returned at this time. The patient remained well for another three weeks and then went to the seaside. The anti-streptococcic serum used was obtained from the Jenner Institute. Mr. George Dean, bacteriologist in charge of the antitoxin department, kindly wrote to say that this serum "was derived from four horses. I used several races of streptococci in immunising these horses; the serum therefore was a polyvalent one. These streptococci were derived from cases of (1) acute abscess; (2) ulcerative endocarditis; and (3) puerperal septicæmia. Two of the races had been exalted to a very high virulence by passage through rabbits." 232 cubic centimetres of the serum were used. 10 cubic centimetres were given at each injection at first; the first injections were followed by a great deal of pain and acute tenderness at the site of inoculation, which became red, swollen, and infiltrated, this swelling and tenderness lasting for a period of from 36 to 48 hours. To secure sleep 15 minims of liquor morphinæ were sometimes given on the night following the injection. After the first five or six injections the patient was troubled with general urticaria which came on three or four hours after each injection. This urticaria was very pronounced and caused intense irritation; it invariably disappeared in the most remarkable way about half an hour after the administration of 15 grains of calcium chloride. The same serum was used throughout.

It will be seen from the chart (Fig. 1) that after the first three injections the temperature fell steadily (by lysis) for four days. As it began to rise again I thought it advisable to give a larger dose and I injected 20 cubic centimetres on Jan. 8th. For some hours after this the patient seemed very poorly, faint, and weak, with a feeble pulse. I did not think it advisable to give so large a dose at one time again, and after giving a dose of 10 cubic centimetres twice a day for two days I administered a dose of 15 cubic centimetres, which seemed to be the proper one in her case. From the 15th to the 28th the improvement in her general condition was so marked that I stopped the injection of serum. So far the injections had always given her much local pain and discomfort, as above stated, and this upset her and kept her back, so that partly on this account I was glad to give her an interval of rest. But on the 28th, as the temperature, though lower in range, was still oscillating in character and above normal, I recommenced the injections. From this time they gave rise to no local pain, urticaria, or red blush at the site of injection, and very slight swelling, but now to constitutional symptoms, consisting of headache and a feeling of malaise for some hours. The same serum was used throughout. On Feb. 9th, at 10 P.M., on the occasion of the sixth injection of the second series, a few minutes after injecting 16 cubic centimetres the patient said that she felt very ill; the respiration became rapid, there was well-marked cyanosis, the pulse was 120 and very weak, and she seemed very ill. She took a teaspoonful of sal volatile and in a little time she was better. The cyanosis lasted about 10 minutes. About noon she had a slight rigor and the temperature rose to 104·6°. She felt ill all day but improved towards evening, the temperature falling to 101° by 9.30 P.M. It is remarkable that after this injection her temperature never rose again but remained for some time subnormal, and her pulse varied from 72 to 80. This seemed the turning-point of her illness, which thus appeared to end by a sort of crisis. Interesting points are the pronounced local effects of the first injections, their disappearance with later ones, and the occurence of constitutional (general) effects. I may add that no changes were found in the urine after the injections and that the punctures all remained aseptic.

I saw the patient on May 3rd after she had spent a month at the seaside and she looked fat and rosy. At first there had been some œdema of the ankles, but this had now passed off and her only trouble was slight shortness of breath on exertion. The heart's apex was in the fifth space in the nipple line, and there was a loud blowing systolic murmur accompanying the first sound, loudest in the aortic area, but audible over the whole of the præcordium and in the back.

Since recovery from ulcerative endocarditis is very rare it may be objected that this was not a case of that disease, but should rather be considered one of rheumatism with pericarditis. But in favour of the former diagnosis are (1) the presence of a chronic valvular lesion on which an infective process is apt to graft itself; (2) the fact that the illness did not yield to the several salicylic compounds which were tried in full doses without effect; (3) the occurrence of a pulmonary infarct; and (4) the steady progress of the patient from bad to worse until treatment by serum was begun, which treatment again would have had no influence on acute rheumatism. I may also mention as possibly of importance in etiology that the patient's house adjoined a large graveyard, now, however, only occasionally opened, that there were several large trees in front of it, and that the first symptoms began in the autumn. These facts are interesting in connexion with Sir T. Lauder Brunton's suggestion that endocarditis is more liable to come on at the time when the leaf falls.[1] I think it also of importance that the serum treatment was begun early.

Clifton, Bristol.

THE VARIETIES OF ACUTE PNEUMONIA.[2]

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THIS subject is far too large for me to deal with exhaustively. I will confine myself to two points—varieties in symptoms and physical signs and varieties in causation. I am speaking only of lobar pneumonia and not at all of lobular or broncho-pneumonia. In an ordinary typical case no difficulty in diagnosis can arise, but exceptional cases may puzzle the most experienced. A physician so expert in physical diagnosis as Dr. Samuel Gee[3] writes: "A physician well read in the book of nature knows that he cannot *always* distinguish between pleurisy and pneumonia. ..... It much more often happens that a small pleural effusion is mistaken for pneumonia. The physical signs of the two diseases may be the same and even puncture is not always decisive."

A rare but somewhat puzzling symptom is low temperature. The following was a serious case of pneumonia where the temperature never exceeded 100·5° F. It occurred in the person of a stout, active man, aged about 56 years, vigorous both in mind and body. One morning, feeling

[1] On Endocarditis and the Use of the Thermometer in its Diagnosis, Edinburgh Medical Journal, May, 1897.

[2] A paper read before the Nottingham Medico-Chirurgical Society on Feb. 21st.

[3] Allbutt's System of Medicine, vol. v., p. 369.

upset, he remained in bed and in the evening had a temperature of 100·5°, cough, and signs of bronchitis. On the following morning—the second of his illness—his temperature was 99·8°, his respiration was 32, and his pulse was 104. He had a frequent irritable cough, which was increased by any movement; his tongue was coated with a yellow fur and there was general prostration. He was coughing up abundant, sticky, fibrinous sputa which adhered to the vessel and did not move when the vessel was inverted. The sputa were abundantly stained with bright blood. On examination impaired percussion resonance was discovered in the left axilla and at the left base, where also there was distinct tubular breathing and bronchophony. Pleuritic friction was audible over a limited area at the lower and back part of the axilla. He was given three grains of calomel and a mixture containing carbonate of ammonia and ipecacuanha. Notwithstanding the moderate temperature he was very ill and prostrate and seemed more likely to die than recover. On the third day his temperature in the morning was 99·8°, his pulse was 104, and his respiration was 28; and in the evening his temperature was 100·1°, his pulse was 108, and his respiration was 30. He was still spitting blood but was decidedly improved. On the fourth day his temperature in the morning was 97°, his respiration was 24, and his pulse was 96. His midday temperature was 98·4°. In the evening his temperature was 97·6°, his respiration was 24, and his pulse was 83. He was improved. The sputum was still fibrinous and it adhered to the vessel but it was less blood-stained. There was pleuritic pain on coughing. Dulness and tubular breathing were still quite distinct. On the fifth day his morning temperature was 97·8°, his respiration was 24, and his pulse was 80. There was now no pain on coughing. For the first time he could lie on the left side. The sputa were barely blood-stained and were becoming frothy. Tubular breathing was still distinctly audible at the left base but was quite gone from the axilla. On the seventh day his morning temperature was 99·2° and his pulse was 100. His evening temperature was 100°. There were occasional râles at the back and a rub in the axilla. He was over-fatigued by having several business interviews in bed. On the ninth day his temperature was 99·0° and his pulse was 88. The pleuritic rub and tubular breathing were quite gone. On the tenth day and afterwards his temperature remained normal and he was convalescent, but it was a fortnight before he regained strength sufficiently to walk out of doors and to go away from home.

In this case the patient's age, stoutness, and habits all tended to make an attack of pneumonia unusually dangerous; but by the fourth day all immediate danger had subsided, although the physical signs remained typical. From the amount of sputa and the area of dulness the extent of lung consolidation could not have been very small and yet there was never high fever. Wilson Fox [4] says: "A few rare and exceptional cases of pneumonia existing without fever have been recorded, but it must be remembered that the pyrexia of pneumonia may last in some cases for only a few hours while the consolidation persists after the fever has disappeared. The occasional apyrexial character of pneumonia is supported by the high authority of Wunderlich. Lebert observed a case where the temperature only reached 100° F. on the sixth day." As a marked contrast to this may be mentioned cases recorded by first-rate observers where the symptoms, both general and special, are well-marked and undoubted, but physical signs are scanty or absent. Some of these it has been proposed to explain by suggesting that the area of lung affected is near the root and does not reach the surface. In other cases it has been suggested that the general symptoms of pneumonia are caused by the products (toxins) of the pneumococcus which may be growing in other organs or places than the lung. As has been recently written: [5] "Most physicians have seen cases of acute pleurisy the clinical course of which has been indistinguishable from that of a pneumonia, but in which post mortem the lung is not found hepatised. In these it is not surprising to learn that the pneumococcus has been found in the pleural lymph by Dr. Washbourn."

This leads me to the second part of my subject—namely, varieties in causation. I hope it will be agreed that it is not sufficient nowadays merely to diagnose pneumonia, but that an attempt should be made to ascertain the cause. Much, both in prognosis and in treatment, may depend upon the cause. Many years ago Skoda,[6] in Vienna, taught that pneumonia was a specific *general* disease, and, pointing to a patient with the general symptoms of pneumonia but with no physical signs in his lungs, argued that this proved that there was a general infection of the blood before the local changes occurred. Some years ago, too, Wilson Fox in his monograph on Pneumonia came to the conclusion that the causes of acute pneumonia were not one but varied.

Of recent years more precision has been given to the question by bacteriology, but much remains to be done, and the subject is by no means worked out. Weichselbaum,[7] in Vienna, in 129 cases of pneumonia discovered the pneumococcus (Fränkel's diplococcus) in 94, Friedländer's bacillus in nine, streptococcus pyogenes in 21, and staphylococcus pyogenes aureus in five. There is also the rod-shaped microbe which was found by Dr. Klein in the epidemic pneumonia of Middlesbrough. Thus the theory of a variety in causation is supported by the variety of micro-organisms found. Moreover, the pneumococcus, which is the micro-organism most commonly found in pneumonia, is sometimes found in lobular pneumonia, sometimes in pleurisy without pneumonia, sometimes in endocarditis and in epidemic cerebro-spinal meningitis, and sometimes in healthy saliva.

It is hardly necessary to point out that the symptoms of pneumonia are not entirely due to the local inflammation of the lung tissue, but in great part to the specific nature of the poison. Not infrequently the symptoms precede the physical signs by several days; the temperature and even the number of respirations fall when the crisis comes, long before the solidified lung has cleared up; and the violence of the fever is not in proportion to the extent of the local lesions. There is much reason to think that the wide variations in symptoms, course, and fatality may coincide with differences in the micro-organisms which predominate in the diseased lung. No one could expect a plague pneumonia, a typhoid pneumonia, and an influenza pneumonia to run the same course.

One of the best examples of specific pneumonia is influenza pneumonia. This usually follows an attack of evident influenza, but in some cases it is the only manifestation of the disease. Probably the latter group accounts for most of the instances of *infection in pneumonia*.

Although the question of infection has been occasionally mooted for many years past its exact position is hardly yet accurately defined. In an experience of over 20 years I have never seen a case of pneumonia in the general hospital give rise to a second case in the same ward or building, neither have I ever known a nurse or medical man to be infected from a patient. We may therefore take it that under hospital conditions, with good sanitation and free ventilation, pneumonia does not ordinarily spread to patients in adjoining beds or to attendants. But in spite of this experience and of the long-established tradition that pneumonia is not an infectious disease cases do occasionally arise which clearly show that under less favourable circumstances pneumonia does spread by direct infection. Wilson Fox [8] quotes Hardwick to the effect that "(1) a priest attacked by pneumonia communicated it to a relation who visited him, and who again communicated it to another relative; and (2) an old man at the point of death from pneumonia sent for his relatives, each of whom was subsequently attacked." It may very well be that some kinds of pneumonia are more infectious than others, especially the pneumonia of influenza. It is highly probable that the six cases which I am about to describe were of this nature. Although influenza was not prevalent at the time in that neighbourhood there were no other signs of influenza and there were no cases of simple influenza or other illness in the house. The first two cases I saw in consultation with Dr. J. J Bingham of Alfreton, the other four were less severe and were kindly communicated to me by Dr. Bingham. The cases occurred in January and February, 1899, in the members of one well-to-do family and in one house.

On Jan. 7th, 1899, a little girl, aged 6 years, was taken ill with symptoms of pneumonia and very soon there were signs

[4] Diseases of the Lungs, 1891, p. 314.
[5] Albutt's System of Medicine, vol. i., p. 674.
[6] Brit. Med. Jour., Nov. 4th, 1899, p. 1268.
[7] Allbutt's System of Medicine, vol. v., p. 113.
[8] Diseases of the Lungs, 1891, p. 262.

of consolidation of the right base with a temperature of 104° F. Four days later the left base became affected. On Jan. 16th, the ninth day of illness, I was asked to see her and found her with a frequent, distressing cough. Her temperature was 101° F., her respiration was 64 per minute, and her pulse-rate was 140. There were Skodaic resonance at the left apex, dulness to percussion in the axilla and lower three-quarters of the left back, increased vocal resonance with loud tubular breathing, and râles over the dull areas. The heart was not displaced. The right base had nearly cleared up. She was nursed chiefly by her mother and spent many hours lying in her mother's arms. I saw her again nine days later—i.e., the eighteenth day—when she was approaching convalescence with a nearly normal temperature and greatly improved general condition, but the dulness and whiffing tubular breathing still remained. She ultimately got quite well.

On Jan. 20th, four days after my first visit to the preceding patient, the mother had a severe rigor and a temperature of 104° F. on the following morning. At my second visit on Jan. 25th her temperature was 102° F., her respiration was 64, her pulse was 160, and she was constantly delirious. There was pneumonic consolidation of the right base and of almost the whole of the left lung. She died early on the following morning, the sixth day of her illness.

A week later, Feb. 2nd, the elder girl, aged eight years, was taken ill with pneumonia. Four days later, on Feb. 6th, a brother, aged 12 years, was seized; and on the next day another brother aged 14 years. Again, one day later, on Feb. 8th, the father was affected. With the exception of the mother, who died, all the patients were ill in bed at the same time suffering from pneumonia and they recovered.

In April, 1900, I was asked to see in consultation with Dr. Buckley of this city a child, aged one year and three months, who was suffering from well-marked lobar pneumonia of both bases. Her temperature was 103·6°, her pulse was 150, and her respiration was 60. The child died. I ascertained that the child's aunt, living in the same house, had only just recovered from a very severe attack of pneumonia in which the temperature had reached 104·6° and in which resolution was by crisis.

There is no doubt that pneumonia does not occur uniformly distributed throughout the year, but is frequently met with in groups of cases not necessarily directly connected, or in small local epidemics. Most of the numerous recorded epidemics have occurred in prisons, workhouses, or ships, and have been associated with overcrowding and bad sanitation. That has not, however, always been the case. I have a letter from Dr. Cardno Still of Shepshed, dated June 15th, 1894, in which he writes: "From a scientific point of view I thought you might be interested to know that we have an epidemic of pneumonia. It has been going on since the end of January. There have been 28 cases and eight deaths. It seems to be almost entirely lobar. The epidemic is confined to the parish—not the village alone—and the surrounding villages are exempt. We have nothing in common here except the atmosphere, for the water-supply is from wells, the sewerage is limited, and the milk is from 20 or more sources. Those following indoor and outdoor occupations are alike attacked. It affects both sexes, but chiefly males, and with few exceptions all are adults." In a subsequent letter he writes: "In 1896, between Dec. 11th and 31st, we had 11 cases and one death."

I had neither the time nor the opportunity to make any local investigation and I believe the cause was never ascertained, but it reminds one somewhat of the Middlesbrough epidemic. That was an example of the next group I come to—namely, *food pneumonias*—that is to say, pneumonia produced by eating poisonous food. "The Middlesbrough epidemic of pleuro-pneumonia was clearly traced by the late Dr. Ballard to the use of American bacon which was made by soaking in water and then only slightly drying salted pork. This bacon was proved to be poisonous to animals fed with it and lung lesions were produced. ..... The Middlesbrough epidemic of food poisoning is to be looked upon as the result of the ingestion of a pneumonia-producing micro-organism."[9] In this instance a pulmonary lesion was caused by infection through the alimentary canal, lacteals, mesenteric glands, thoracic duct, subclavian vein, right side of the heart, and pulmonary arteries, just as no doubt many cases of pulmonary tuberculosis arise through the alimentary canal from the ingestion of the tubercle bacillus in milk.

Another form of pneumonia of which we have seen nothing in modern times in this country is *plague pneumonia*, but the experiences of Vienna as well as of India show that in this exceptional form of plague the resemblance to ordinary (croupous) pneumonia is so close that the first cases are seldom diagnosed. Bubonic plague, as is known, specially implicates the lymphatic system and glands, and it is conceivable that the early infection of the lung is due to the failure of the glands to check the course of the poison on its way to the veins and right side of the heart.

The last form of pneumonia of which I propose to speak is *typhoid pneumonia*. I do not allude to the pulmonary catarrh, or broncho-pneumonia, which is found in some degree in a large majority of the severe cases of enteric fever. I refer to a very much more restricted but sharply defined class of cases, of which I have seen several. They commence with an attack of acute lobar pneumonia displaying the usual symptoms and physical signs, and it is only by the prolonged duration and after-course of the illness that enteric fever is suspected. In three cases at present in my mind the pneumonia attack was typical and was the commencement of the illness. In one the presence of enteric fever was proved by finding well-marked intestinal lesions post mortem. In a second the presence of spots, intestinal distension, and copious intestinal hæmorrhages established the diagnosis beyond doubt. This patient recovered. The third occurred in a lad, aged about 15 years, who was admitted into the Nottingham General Hospital with a sharp attack of acute pneumonia. By the seventh or eighth day the temperature fell to about 100° F., but after a few days it began to rise again. He then went through a well-marked attack of enteric fever and recovered. In this case, although the temperature did not reach normal between the two illnesses, there was more of an interval than in the other two. Dietl thought that "the poison of typhoid might attack the lungs instead of the intestines, and Sturges has also expressed the opinion that pneumonia may be only another localisation of typhoid." Wilson Fox[10] writes: "There are, it is true, a certain number of cases where pneumonia commences early in typhoid fever and where it is liable to be mistaken for the primary disease. Such cases are very rare; they do not show critical symptoms and with the further progress of the case the character of the typhoid fever become marked." Bonnemaison relates how in one house a man and his wife died from malignant pneumonia; soon after a son and daughter suffered from typhoid fever.

I do not know whether the typhoid bacillus was present in the lung in the cases which I have mentioned. They occurred several years ago when the micro-organisms associated with pneumonia were less well known. I was inclined at the time to consider them as instances of double infection, the pneumonia organism developing more quickly in the lung than the enteric organism in the intestine, but I have been led to think that there may have been only one poison and one channel of infection. We have seen that the infection of pneumonia may enter the lung through the intestine (e.g., Middlesbrough food epidemic); and I am equally convinced that the poison of enteric fever may enter through the air passages. I am aware that this is denied, but until comparatively recently it had been erroneously taught for one or two generations that there was an absence of direct infection in typhoid fever.

One further point and I have done, and that is the influence of bad sanitation in producing pneumonia. To quote Wilson Fox[11] again: "Many isolated cases of pneumonia orginate in insanitary conditions of house drainage." Out of 1065 cases of pneumonia from the Collective Investigation Record in 47·5 per cent. the sanitary state of the house was bad, doubtful, or indifferent.

In conclusion, I think I have now given some reason for the opinion with which I commenced, that the causes of pneumonia are various, and have offered some explanation, however inadequate, of the fact that several micro-organisms have been found associated with the same disease.

Nottingham.

[9] Report of the Medical Officer to the Local Government Board for 1888.

[10] Diseases of the Lungs, p. 268.
[11] Ibid., p. 265.

RODENT CANCER OF THE CORNEA; OPERATION; RECOVERY WITH RETENTION OF GOOD SIGHT.

BY SYDNEY STEPHENSON, M.B. EDIN.,
OPHTHALMIC SURGEON TO THE EVELINA HOSPITAL FOR SICK CHILDREN, ETC.

RODENT cancer of the cornea is undoubtedly one of the rarest affections of the eye. Indeed, so far as I know, not a single case has yet been reported in periodical English literature. Since the malady was described by Mooren in 1867[1] several excellent papers upon the subject have been published abroad. One of the latest, by Schmidt-Rimpler of Göttingen, is especially valuable. It contains the first account of the pathological examination of an eye affected with rodent ulcer. It may be found by those interested in the *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1898, p. 114. The rarity of rodent corneal cancer renders it almost unnecessary to offer any apology for recording a case which I was enabled to follow rather closely and to operate upon with success.

The patient, a female, 60 years of age, was seen by me on May 17th, 1897, in consultation with Mr. Frederick E. Fenton of Ealing. It appeared from the history of the case that the left cornea had become ulcerated in the previous March, but under Mr. Fenton's treatment that soon subsided, only to be followed by redness of the right eye. The patient, a hale and hearty person of determined character, had herself never suffered from definite gout or rheumatism, although her maternal grandfather had died at an advanced age from the former affection. The patient regarded herself as extremely subject to "colds." Upon examination the right eye showed several of the curious violet elevations or nodules characteristic of scleritis. Two months later (July 16th) the condition was as follows: Right eye.—A large, somewhat elevated patch of episcleritis lay on the outer side of the eyeball, its central parts being rusty and soft-looking and its peripheral parts pinkish-red. The nodule was not tender. There was a little photophobia, but tension was normal and there was no iritis. The lower outer quadrant of the cornea was rather hazy and a few vessels ran into it from the neighbouring sclero-corneal margin. There had been some pain, chiefly nocturnal, in the right temple. Left eye.—A corneal haze was present in the lower inner quadrant of the cornea. A change to the seaside was recommended and the patient was not seen again until Sept. 16th. On that date the outer side of the right eyeball showed a large patch the centre of which was slate-coloured and the periphery dull-red. Its central, dark-coloured area looked almost pulpy in consistence. Neither tenderness nor pain existed. The general condition was good.

The patient was not seen again until May 10th, 1898, when Mr. Fenton asked me again to examine her. The episcleritis from which she suffered was said to have made slow though satisfactory progress until April 24th when the cornea was slightly injured whilst taking off her glasses. The eye since then had watered, been sensitive to light, and had felt generally uncomfortable. Right eye. — The episcleritis had left behind it a slightly depressed, lenticular patch of slaty hue. An oval ulcer of singular appearance now involved a limited portion of the outer side of the cornea below the horizontal meridian. Towards the sclera it was bounded by a vascular area and enlarged conjunctival vessels, and its cavity appeared to be filled with some kind of gelatinous material. The palpebral conjunctiva was slightly reddened. The iris was active and not discoloured. There was no lacrymal mischief. Tension was normal. Vision, $\frac{6}{9}$. Left eye.—There was a haze over the cornea, as mentioned previously. Tension was normal. Vision, $\frac{6}{12}$. The treatment advised included (*a*) the application of iodoform to the ulcer; (*b*) the wearing of dark, protective goggles; and (*c*) the administration of a pill of carbonate of iron twice a day. By June 2nd the ulcer of the right cornea had increased in size, its advancing edge had become irregular, and small vessels were present at its base. There was no actual pain, although the affected eye felt uneasy from time to time. On June 30th there was slight photophobia and watering of the right eye, but no pain. The ulcerated spot in the right cornea was larger, and now presented a raised, sinuous edge, advancing towards the central region. My suspicions with regard to the malignant character of the ulcer were hinted to the patient and explained fully to the medical attendant, Mr. Fenton. On August 4th, the patient complained of an occasional sensation as of a foreign body in the eye; there was, however, little actual pain. Some photophobia was present, but there was no especial redness. The outer and lower part of the right cornea was occupied by a grey, depressed, and uneven ulceration, the advancing edge of which was grey, sinuous, and rather raised. A number of fine vessels, derived from a large trunk in the conjunctiva, ramified over the base of the ulcer. The appearance of the parts is shown in the appended diagram. The lesion, it will

Diagrammatic representation of cornea, showing ulcerated portion and vessels derived from trunk in conjunctiva. Right cornea, August 4th, 1898.

be observed, did not encroach upon the pupillary region of the cornea. The pupil was small and active and there were no signs of iritis. The fundus was in its normal state. Tension was normal. Vision, $\frac{6}{12}$ + 1·5 D. spherical = $\frac{6}{9}$. The glands were not involved. A definite diagnosis was made of rodent cancer on the cornea and operation was advised.

On the following day, under cocaine anæsthesia, the ulcer was thoroughly burnt with the galvano-cautery, special attention being paid to the aggressive margin. The operation (at which Mr. Fenton assisted) was of a somewhat delicate character owing to the care that had to be exercised not to interfere with the clear cornea that lay in front of the pupil. It was followed by pain, œdema and ecchymosis of the eyelids, as well as by marked redness of the globe. On Oct. 13th the lower half or so of the ulcer had cicatrised in a smooth and satisfactory way, but the remainder was uneven, rugous, and permeated by fine vessels. The corneal sensibility as regards both eyes was certainly diminished. This last observation is interesting and bears out Ahlström's statement[2] that such is the case in rodent ulcer of the cornea. Two days later, under local anæsthesia, the galvano-cautery was freely applied to the roughened portions of the cornea. By Feb. 2nd, 1899, the ulcer had completely healed. Right vision, $\frac{6}{9}$. On June 8th the outer third of the right cornea was the seat of a slight opacity, delicate extensions from which crossed the pupillary region. Vision, $\frac{6}{9}$ + 1 D. cylinder axis horizontal $\frac{6}{12}$ iv. With presbyopic correction (+ 3·5 D. spherical) the patient could read slowly the smallest type on Jaeger's test-card. To judge from the refraction, which had formerly been spherical, the operations had slightly altered the curvature of the affected cornea.

Upon inquiry I learn from Mr. Fenton that the patient died on Jan. 12th, 1900, from influenza and failure of the heart. The corneal mischief, however, never recurred, nor did the eyes cause any further trouble.

Welbeck-street, W.

[1] Ophthalmiatrische Beobachtungen, Berlin, p. 107.

[2] Klinische Monatsblatt für Augenheilkunde, Mai, 1898.

FOUR CASES OF PUERPERAL ECLAMPSIA.

BY T. B. BROADWAY, M.B., CH.B. GLASG.

THE cases of eclampsia now to be described occurred in my practice during the last six months and presented some points of interest. In the first case the high temperature and the length of time for which it kept up were remarkable, especially as there was nothing septic to account for it.

CASE 1.—In the last week of December, 1899, I was called to a primipara attended by Mr. Goodfellow of Roche. She

was a strong, healthy woman, aged 19 years, and had a normal labour except that Mr. Goodfellow removed the placenta by inserting his hand. She did well for three days, then convulsions came on; Mr. Goodfellow saw her and gave a hopeless prognosis. I was called in on the fifth day; she was then lying comatose, with dilated pupils, a pulse of 140 per minute, and a temperature of 106·2° F.; her mother also stated that she had not passed urine for the last 24 hours. I gave her an hypodermic injection of two grains of pilocarpin nitrate. Shortly before I left, as convulsions again came on, I gave her an enema of one ounce of sulphate of magnesium and one drachm of bromide of potassium as well as douched out her uterus and ordered her mother to keep her on milk and soda-water, feeding her every half hour. On the following day I found her temperature still 106°, but there had been no recurrence of fits and she had passed both fæces and urine in her bed unconsciously. On account of the high temperature I gave her three-grain doses of phenacetin every three hours and put her on the following mixture: solution of perchloride of iron, two drachms; sulphate of magnesium, two ounces; tincture of digitalis, half a drachm; spirit of nitrous ether, two drachms; water to make up eight ounces; one ounce to be taken every four hours. On Dec. 23rd I found her temperature to be 104·8°, and as she was still insensible I asked Dr. Shaw of St. Austell to see her with me. As he thought there might be some uterine mischief, though there was no discharge, I again douched out the uterus with perchloride (1 in 2000). On the following day as her temperature was still 104·4°, I again douched her out with chinosol. On the 25th I found her temperature to be 102·4° and her pulse 120, and for the first time she seemed to notice things—she inquired who I was, and on being asked how she felt she made a complaint of pain in her head and back. I now managed for the first time to obtain some urine and found it loaded with albumin; her recovery, however, from this period was steady, though she was on my hands till the end of January, 1900.

CASE 2.—This patient was a young woman 4 feet 8½ inches in height and very spare. Mr. Goodfellow was attending her; she had been in labour for 48 hours when he telegraphed for me. He told me that she had had several fits and that her labour pains were very unsatisfactory. I found the woman conscious but looking anxious and worn. On examination per vaginam I found the os dilated to the size of half-a-crown. I advised rapid dilatation and instrumental delivery under an anæsthetic. As Mr. Goodfellow agreed we gave her chloroform and delivered her after a little trouble. Her further progress, so far as I am aware, was uneventful.

CASE 3.—I saw this patient for Dr. Shaw of St. Austell. The woman was a multipara, this being her fourth confinement. She had an ordinary labour and was attended by a midwife. On the following day she had convulsions when Dr. Shaw asked me to see her. I found her lying semi-conscious with the muscles of her face twitching; her temperature was 99·4° F.; and her pulse was 110 and irregular. I gave her an injection of half a grain of pilocarpine along with a quarter of a grain of morphine and a mixture containing bromide of potassium and sulphate of magnesium. Since then she has had no more fits, but is still in our hands for albuminuria and anæmia.

CASE 4.—I was called to this patient on June 23rd; on arriving I heard that she had been having labour pains for the last 13 hours but that the friends had sent for me as she had had two or three fits the hour previous to my arrival. The patient was very anæmic. I found her tongue bitten and could elicit no replies to my questions; the os was dilated to about the size of a sixpence. I gave her the following mixture: sulphate of magnesium, one ounce; bromide of potassium, three drachms; water to make up two ounces; one ounce to be taken every three hours. This lessened the number though not the severity of the convulsions, and as on a later visit, some six or seven hours after the first, I found the os dilated to the size of a florin and as she had passed no urine I asked Dr. Shaw to see her with me. We agreed to give an anæsthetic and deliver under it. In this we found no difficulty. We passed a catheter previously to using instruments and drew off half a teacupful of bloody urine. The patient is progressing fairly, though she is not very clear in her answers; there is still a little trouble in her passing urine. Previously to this she was being treated by Dr. Shaw for anæmia and amenorrhœa.

St. Denys, Cornwall.

A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

ST. GEORGE'S HOSPITAL.

A CASE OF SUPERNUMERARY TESTIS.

(Under the care of Mr. G. R. TURNER.)

UP to a recent date the possibility of a third testis has been denied. For instance, Mr. Jeremiah McCarthy in Quain's Dictionary, 1882, p. 1606, wrote: "Supernumerary testicles have been described and men not unfrequently believe themselves to be so gifted. The mistake has arisen from the presence of encysted hydroceles or of fatty or fibrous tumours of the cord, or of an old epiplocele. There is no well-authenticated case recorded of the presence of more than two testicles." The same opinion has been expressed in a still more recent work. Lydston,[1] writing in 1899, says: "It is probable that the third testicle is a myth." Yet a few indubitable cases have been recorded in which the supernumerary testis has been removed and examined microscopically. A very remarkable case is described in the *New York Medical Record* of Feb. 23rd, 1895. A recruit of the Eighth Cavalry was found to be possessed of four testicles, three of them being well developed; but in this case, as no operation was performed, no histological examination was made, and the diagnosis may reasonably be considered unsettled.

A healthy-looking child, aged three and a half years, was admitted into St. George's Hospital on July 30th, 1894. On the right side of the scrotum there was an irreducible swelling which was transparent and looked at first sight

A represents the lower (larger) testicle with its hydrocele. B represents the upper testicle with a normal tunica vaginalis. C represents the serous sac in front of the upper part of the cord, with apparently no communication with the peritoneal cavity. *b* and *d* represent the cords of the two testes which seemed to join above.

like a hernia above a hydrocele. The testicle could be felt at the bottom of the scrotum and above this another rounded lump could be distinguished. Mr. Turner cut down on the swelling and separated it from the cord. The upper part was a serous sac full of clear straw-coloured fluid but containing no gut and not communicating with the peritoneal cavity. This cyst was removed. Below it were two testicles; the upper one had a normal tunica vaginalis and a distinct cord of its own and the lower and larger one was in the usual position of the testis with the sac of the tunica vaginalis the seat of hydrocele. This was laid open and its margins were stitched to the skin wound. The boy did well afterwards, though his convalescence was retarded by a whitlow and a portion of the wound healing of necessity by granulation. The left testis appeared to be normal.

[1] Surgical Diseases of the Genito-urinary Tract, p. 921.

Remarks by Mr. TURNER.—An almost exactly similar case was, curiously enough, a fortnight later under the care of Mr. Arbuthnot Lane[2] in Guy's Hospital and has been reported by him.[2] In his case, too, the cord of the supernumerary testis blended above with the spermatic cord but there was no hydrocele. Microscopical examination of the supernumerary testis which Mr. Lane removed showed "well-formed tubules with spermatogenesis proceeding." His patient was a youth, 17 years of age. In the case above related, as in Mr. Lane's case, it would seem that the supernumerary testis is developmentally a subdivision of the larger organ on the same side.

QUEEN'S HOSPITAL, BIRMINGHAM.

FOUR CASES OF CHOREA TREATED WITH LARGE DOSES OF ARSENIC.

(Under the care of Dr. A. H. CARTER.)

IN the successful employment of arsenic in chorea it is now generally agreed that large doses must be administered, and if the initial dose is small it may be slowly or rapidly increased to the maximum. It is now recognised that a large dose of arsenic for a short time is better borne than a smaller dose for a long time. De Renzi[1] has advised that 20 minims of the liquor arsenicalis should be given at first in the case of children and double that amount in the case of adults. These amounts are probably a little excessive as initial doses, but on the whole children stand arsenic well. In all cases much better results are obtainable if the patient is confined strictly to bed. For the notes of the cases we are indebted to Dr. W. Billington, house physician.

CASE 1.—A girl, aged 13 years, was admitted into the Queen's Hospital, Birmingham, on Feb. 13th, 1900. For five weeks she had had choreiform movements and these, in spite of treatment at home, had got worse. Three years previously the patient had acute rheumatism. This was followed by an attack of chorea lasting four weeks. 18 months before admission she had a second attack of chorea. The third and present attack was the most marked and the most resistant to ordinary treatment. The movements were general but not violent, taking the form of persistent "fidgeting." The patient was unable to write or to hold anything in her hands and her speech was slightly affected. The first heart sound was blurred in the mitral area and the apex beat was in the nipple line, but compensation was good. On Feb. 14th the patient was ordered to have 15 minims of solution of arsenic three times a day. The medicine in this case, as in all the others, was given in the middle of a meal in a wine-glassful of water. No signs of intolerance appeared until the 20th, when she vomited once shortly after taking the arsenic. On the 21st the arsenic was stopped altogether, 315 minims of Fowler's solution having been taken in a week. During the time the patient was taking the arsenic she ate and slept well and exhibited no signs of intolerance except the single occasion on which she vomited. A marked improvement in the chorea was noticed on the fourth day and at the end of the week all movement had practically ceased. On Feb. 24th she was allowed to get up and on March 1st she was discharged from the hospital quite cured. She was subsequently under observation for two months and during that time she showed no signs of a relapse.

CASE 2.—A girl, aged six years, was admitted into the Queen's Hospital, Birmingham, on April 23rd, 1900. Chorea had come on for the first time 10 days before admission and quickly became very violent, so much so that her mother was scarcely able to hold her in her arms. The whole body was affected and she was very excited and passionate. There was no very definite history of rheumatism, but the child was said to have had indefinite pains in her legs and thighs for the last six months. These were described as "growing pains." The heart was unaffected. On April 23rd the child was put on 15 minims of solution of arsenic three times a day, and on the 24th this was increased to 18 minims three times a day. There was an immediate and marked improvement and on the 28th the chorea had almost subsided and the patient was eating ravenously and sleeping well without sedatives. No signs of intolerance appeared until the 29th, when she vomited twice after taking her medicine. On the 30th the arsenic was stopped, 354 minims of solution of arsenic having been given in seven days. On May 1st the patient vomited after each meal. The breath was foul, the tongue was furred, the bowels were constipated, and the abdomen was retracted. She was perfectly quiet and seemed to be heavy and dull. An aperient was given together with a simple enema, and the bowels having been freely opened bismuth was given every four hours in 10 grain doses for 24 hours. The vomiting persisted for several days and then stopped, and the patient rapidly convalesced. On May 5th she had a slight twitching of the hands, but this disappeared in a day or two. On the 8th she was allowed to get up and on the 14th she went out of hospital without a trace of chorea having been noticed for a week. She was in hospital for 21 days.

CASE 3.—A married woman, aged 25 years, was admitted into the Queen's Hospital, Birmingham, on April 21st, 1900, with hemichorea of the left side. The chorea had come on a fortnight before admission. 15 weeks previously she had an attack of acute rheumatism and at the time of admission she still complained of obscure pains in her joints, though there were no objective joint changes. She had had three children and at the time of admission was probably two or three months pregnant. She had never had chorea before and only the one attack of rheumatism. The movements were confined to the left arm, the left leg, and the left side of the face, and the patient was unable to hold anything in her left hand on account, as she said, of the jerky movements and a sense of weakness in it. Since the onset of the chorea she had slept badly, had lost her appetite, and had become very excited and emotional. The knee-jerk and plantar reflex on the left side were very lively and a spurious ankle clonus was obtained. The first heart sound was impure, but there were no definite murmurs. On April 22nd the patient was put on 15 minims of solution of arsenic three times a day. On the 24th she vomited once, but three hours after taking her medicine. After this she gradually became worse, the chorea became more marked, and, passing to the other side, affected the whole body. The movements became very violent, the patient got out of bed, shouted, and wept, and did not sleep at all for two days and two nights. When spoken to she answered rationally for a moment, but at once wandered off to something else and at times was very delirious. The bowels were confined, the urine was scanty, and the appetite was very poor. The arsenic was steadily persisted with and on April 28th she began to improve, she slept better, and was much quieter. On the 29th the arsenic was stopped, 315 minims having been taken in seven days. On the 30th the movements had almost ceased and no symptoms of intolerance appeared from first to last. After this improvement was steady and on May 6th all movement had ceased and the patient was able to sew and to read. She ate well and slept well. On the 11th she went out quite well, no movements having been noticed for six days. Ten days later she again reported herself and was then looking much better and stated that she was quite steady and had had no relapse.

CASE 4.—A girl, aged seven years, was admitted into the Queen's Hospital, Birmingham, on May 3rd, 1900, with mild general chorea. The patient had always been excitable and irritable and was "very bright at school." There was no history of rheumatism obtainable. The chorea came on for the first time three weeks before admission, and at the same time her temper became worse and she was very peevish. No improvement followed treatment with small doses of arsenic as an out-patient. On admission the movements were slight, but affected the face and all the limbs. There were no heart murmurs and all the organs appeared to be healthy. On May 6th the child was put on 15 minims of solution of arsenic three times a day. She vomited once on the 7th and twice on the 8th, after which the dose was reduced to 10 minims. She continued to vomit once or twice every day until May 13th, when the arsenic was stopped, 240 minims having been taken in seven days. The vomiting was the only sign of intolerance. During the whole time the patient was taking the arsenic she rapidly improved and on the 13th there were no signs of chorea present. On the 14th she got up and walked about steadily and did some knitting. She was discharged quite cured on the 18th, no movements having been noticed for six days.

Remarks by Dr. BILLINGTON.—These four cases being fairly representative of chorea as commonly met with strongly emphasize the value of arsenic in large doses as a curative remedy and prove the efficiency of Dr. William Murray's

[2] Transactions of the Clinical Society of London, vol. xxviii., 1896, page 59.

[1] American Journal of Medical Science, May, 1896.

method of administration. In none of the cases was any other remedy used; the patient was simply kept in bed on a good diet, with the bed screened off from the rest of the ward. The two points of especial interest which the above cases present are the rapidity with which a cure was affected and the ease with which large doses of arsenic were borne and the insignificance of the symptoms of intolerance. Looking over the hospital records of cases of chorea treated as in-patients I find that the average length of stay is about six weeks, and even after much longer periods many cases have been sent away only partially cured. The average stay in hospital of the above four cases was only 18 days, and all four had shown no signs of chorea for at least five or six days before they were discharged, and all four were allowed to get up and mix with the other patients for several days before going away. This in itself is a very important advantage in a general hospital where there is always great pressure on the beds. With regard to the second point, I am fully in accord with Dr. Murray's statement that large doses of arsenic given for a short space of time in the way he recommends are much less likely to be followed by serious symptoms of poisoning than when it is given in steadily increasing doses over a much longer period of time. It is well known that the latter procedure only brings about appreciable improvement when the dose has become relatively large and the system is brought thoroughly under the influence of the drug. Of course, the treatment adopted in the above cases can only be undertaken when the patient can be kept under close observation and seen at least once a day. In such cases it would seem to be of great service and may with advantage be employed in preference to the persistent administration of small doses of arsenic, the results of which are often very tedious and unsatisfactory.

Medical Societies.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

Exhibition of Cases and Specimens. — Residual Urine in Cases of Enlarged Prostate.—Paralysis of the Vertical Movements of the Eye.—Landry's Paralysis.

THE ninth ordinary meeting of this society was held on July 4th, Mr. A. G. MILLER, the President, being in the chair.

Dr. NORMAN WALKER showed two cases of late Syphilides. The first was that of a woman with an affection of the skin over the nose. The diagnosis lay between it being a specific lesion or lupus erythematosus. It was even suggested that it might be a case of lupus vulgaris closely simulating lupus erythematosus. The appearance, however, of a small, sharply punched-out ulcer, the history of a sore-throat, and the rapid development of the affection (within six months), together with the fact that the patient had improved under the administration of iodide of potassium, pointed undoubtedly to its specific origin. The case illustrated the fact that specific lesions might closely simulate any other disease. The second syphilide occurred in a girl, aged nine years. A large number of crusted nummular masses were scattered over the skin of the left side of the body and thigh. Where these had healed deep round scars were left. The treatment in this case consisted in the application of mercury by means of a bib applied to the skin of the chest. No medicine was required to be taken inwardly when it was administered in this way.

Dr. WALKER also showed a man suffering from Ringworm of the Beard. An unusual deformity resulted on the healing of the pustules—a whole crop of tiny little nodules was left on the side of the face and chin.

Mr. J. W. DOWDEN showed a boy, aged five years, after operations for Tubercle of the Upper Ulnar Epiphysis. The abscess had been opened and the sinuses scraped several times. Now the wound was completely healed and perfect movement of the joint persisted.

Dr. LOGAN TURNER showed a case of Asthma in a man associated with Chronic Suppuration in the Left Frontal and Maxillary Sinuses. The first operation consisted in opening the left antral cavity, and later the left frontal sinus was opened through a very small buttonhole-shaped incision towards the inner side of the left eyebrow and curetted. Since these operations there had been no escape of pus into the nose and the asthma had greatly improved. The case was one of double interest—the co-existence of asthma along with disease of the left antrum and frontal sinus.

Dr. WILLIAM RUSSELL exhibited a man, aged 58 years, showing the typical signs and symptoms of Myxœdema—a condition which was much more rarely met with in men than in women. The scalp was completely devoid of hair and the beard and whiskers were scanty. The baldness began to show itself three years previously. The condition of mental lethargy, slowness of speech, apathetic facies, swelling of the eyelids, and malar flush were characteristic.

Dr. WILLIAM RUSSELL showed the following specimens: 1. The Brain and Heart from a case of long-standing Aphasia and Hemiplegia. The patient was a man who was said to have had a sunstroke 12 years previously to his death which was due to phthisis. In the left hemisphere a series of large cysts filled with fluid was present. These had resulted from an embolism in one of the branches of the middle cerebral artery. The heart showed the evidences of an old vegetative endocarditis specially affecting the mitral valve. These vegetations had become quite fibrous. An old aneurysm below the aortic segment was also present. 2. The Brain from a recent case of Aphasia and Hemiplegia. The lesion in this specimen occupied almost the same situation as in the preceding and was quite as extensive. A thrombosis was the cause in this case and this resulted from extensive atheroma of the cerebral vessels. The woman did not die from this disease. Thrombosis or embolism produced the same effect in the brain, a softening of the brain substance resulting, and, if the patients lived long enough, cyst formation resulted.

Dr. PEARSON (for Dr. G. A. GIBSON) exhibited: (1) a specimen showing Patency of the Ductus Arteriosus which was diagnosed during life and proved to exist after death which was due to pneumonia of the right lung; and (2) microscopic specimens of the Filaria Sanguinis in the Proboscis and in the Muscle of the Mosquito.

Mr. HARVEY LITTLEJOHN exhibited: 1. A Heart ruptured by Traumatism. The case was that of a young man who was crushed between the buffers of two railway carriages. The railway company denied any liability as there were no external signs of injury or any fracture of the ribs. The post-mortem examination revealed an extensive rupture of the right auricle fully one and a half inches in length. 2. The Stomachs from two fatal cases of Carbolic Acid Poisoning. One of these resulted from the drinking of 10 ounces of the acid and in this case the stomach showed the ordinary typical appearance, being contracted and leathery and covered with a white putty-like material. In the second case some of the crude carbolic acid used for ordinary disinfection had been drunk out of a beer bottle, and yet though this is much weaker than ordinary carbolic acid the patient died in 15 or 20 minutes. Mr. Littlejohn drew attention to the fact that the proper treatment of all of these cases of poisoning even by the corrosive poisons was the passage of the stomach-tube and the washing out of the stomach. It was better to run the risk of perforating the stomach than the greater risk of death from the action of the drug. 3. The Liver and other Organs from a case of Acute Yellow Atrophy. The case was that of a young woman who had become pregnant and whose lover had refused to marry her. She was seized with intense jaundice and vomiting. Labour ensued and she was delivered by forceps but died 36 hours later. The post-mortem examination showed the presence of numerous hæmorrhages in the skin and organs of the body. The case was one of phosphorus poisoning or acute yellow atrophy (the liver was much atrophied). Tests for phosphorus proved negative, but this did not exclude the possibility of her having swallowed the poison. Her mental condition was such as might have induced her to commit suicide. The uterus was perfectly healthy and presented the normal appearances of the organ at this period after delivery and its condition precluded the idea of acute septicæmia. The stomach was also shown to illustrate the appearance of post-mortem digestion.

Dr. R. A. FLEMING showed: (1) Tuberculous Pericarditis (a rare condition) from a man, aged 40 years, who died from general miliary tuberculosis; (2) Hearts with Patent Foramen Ovale—in one case the opening was very large;

and (3) Fatty Degeneration of the Heart Muscle from a case of Pernicious Aæmia.

Dr. ALEXANDER BRUCE exhibited the Brain from a case of Aphasia. The specimen was from a man who had suffered for a long time from right-sided hemiplegia with aphasia. He was capable of understanding what was said to him but could not read. He spoke volubly but unintelligibly. Being very musical he could sing several tunes perfectly, but the words were gibberish though the rhymes were always conserved. He also retained the power of mimicry to a remarkable extent. The post-mortem examination showed a line of softening running along the whole length of the Sylvian fissure. The superficial portion of the first temporal lobe was conserved and there was only a very slight softening in the angular and supramarginal gyri.

Mr. DOWDEN showed a specimen removed from a child, 14 months old, who had suffered during five days from sickness and vomiting. The left thigh was kept flexed and there was a swelling in the left groin of the size of a hen's egg. The bowels acted properly. On opening the sac the testicle was found with the cord twisted several times. The testicle and part of the cord were removed.

Dr. ALEXANDER JAMES exhibited a specimen from the body of a man who was supposed to have suffered from Abdominal Aneurysm. The deceased was aged 40 years; he was an old soldier, had suffered from syphilis, and had atheromatous arteries. There were a double aortic murmur and a large pulsating tumour over the abdominal aorta. The post-mortem examination showed the presence of a tumour lying over and around one side of the abdominal aorta; the growth was malignant, very vascular, and with many hæmorrhages in it. Dr. James had not made a diagnosis of aneurysm as the aorta seemed a little more fixed than usual and there was no alteration in the pulsations of the femoral arteries as shown by the sphygmograph.

Mr. A. G. MILLER read a clinical note on Residual Urine in cases of Enlarged Prostate. He stated that an enlarged prostate by itself was often enough harmless and was frequently unattended by any symptoms. The danger lay in the residual urine left in the bladder and at present the usual remedy for this was the systematic use of the catheter. Mr. Miller advocated the importance of voluntarily emptying the bladder a second time a few minutes after apparently emptying that organ. He described the case of an active man in whose bladder about three ounces of residual urine were always present. This patient by a systematic voluntary emptying of his bladder by again trying gradually decreased the amount of residual urine until, perhaps, only from two to seven drachms were found retained. He found that he did not require to get up so often during the night and generally improved greatly in health. Mr. Miller thought that usually the bladder was not emptied because a sufficient effort was not made to do so. He asked why an old man with an enlarged prostate did not empty his bladder completely. In old age the muscular power generally diminished and consequently the muscles of the bladder were feebler, and this was associated with an enlarged condition of the prostate. There were two important factors and there might be a third unrecognised factor in this causation—i.e., laziness, impatience, or indifference—which might make the patient stop emptying his bladder as soon as the feeling of distension was relieved. Mr. Miller stated that the great cause of residual urine at first was neglect to empty the bladder; later there might be inability to empty it but neglect was the initial factor. In normal conditions the emptying of the bladder took place without any effort, there being merely the relaxation of certain muscles and the contraction of others, assisted by the atmospheric pressure. The action was partly voluntary and partly involuntary, but the whole process partook more of relaxation than effort, and the relief was pleasant because it was unattended by effort. When a man began to suffer from enlarged prostate, as he had hitherto passed water without effort he consequently did not exert himself. It was much a matter of habit. The rational treatment was to break off the habit at the beginning and to establish the habit of emptying the bladder by a second trial. In advanced cases of prostatic hypertrophy the patient strained to pass water, but atony of the bladder had taken place and the effort was almost useless. The voluntary emptying of the bladder ought to be commenced early. In advanced cases the bladder become hypertrophied, enlarged, and sacculated. The conclusions arrived at were that (1) residual urine was due at first to neglect to empty the bladder; and (2) the accumulation was then due to this becoming a habit. The patient ought to be taught in the beginning of the disease to wait a minute or two after passing water and to try again. He ought to practise this until the residual urine amounted to perhaps only half an ounce. This second trial might be practised twice or thrice daily until the residual urine was got rid of and the bladder regained its tone and resumed its function. This treatment was a safe and easy method and one which might postpone the otherwise almost inevitable period of catheter life.—Dr. ALEXANDER JAMES thought that there was a strong analogy between the condition in the bladder and that found in the lungs. As age advanced the residual air in the lungs went on increasing until emphysema resulted. He stated that a singer must be taught to get rid of this residual air before beginning a new inspiration. He must end a note by compressing his chest and must not begin inspiration until the chest was empty of air.

Dr. ALEXANDER BRUCE read a note of a case of Paralysis of the Vertical Movements of the Eye with Conservation of the Lateral Conjugate Deviation without Ptosis. Cases of paralysis of conjugate deviation with retention of the up-and-down movements of the eyeball were, he said, frequent enough and the reason was well understood. Lateral conjugate deviation was effected through the sixth nucleus which supplied not merely the external rectus muscle of its own side but also indirectly the internal rectus of the opposite side, very much as the reins acted in the hands of a coachman driving a pair of horses. The sixth nucleus was at a considerable distance from the third and fourth nuclei or the other nuclei for the muscles of the eye. A lesion might consequently destroy the sixth nucleus without disturbing the other movements of the eyeball. The opposite condition, however—viz., paralysis of the upward and downward movements of the eye with conservation of the lateral movements—was extremely rare. The cases of this kind described were not more than five in number. *A priori* it might be thought to occur in certain lesions of the middle lobe of the cerebellum. Ferrier stimulated the anterior portion of the middle lobe of the cerebellum and the eyes moved upwards while the head moved backwards. Stimulation of the posterior part of this same lobe caused the eyeballs to be directed downwards and the head forwards. Stimulation still further back caused lateral movements of both eyeballs. A lesion of the upper part of the middle lobe of the cerebellum causing destruction might produce inability to raise the two eyeballs. In one of the cases related a girl lost the power of raising the eyeballs though there was no ptosis. At the post-mortem examination it was found that there was a small tumour at the upper part of the middle lobe of the cerebellum destroying the valve of Vieussens, part of the middle cerebellum lobe itself, and part of the path from the middle lobe; in other words, the centre for the upward movement of the eyeballs was destroyed. The case which Dr. Bruce himself investigated was that of a hard-working female mill-worker, aged about 45 years, who had suffered from what was said to be influenza. She had had some difficulty in walking but had recovered from this. On examination there was found to be a practically complete inability to raise the two eyes in the least and only a very feeble power in depressing the eyes. When asked to raise the eyes she merely looked straight forward; there was no ptosis. When asked to look downwards the eyes descended only very slightly. The lateral movements of the eyeballs were, however, brisk and complete, as was also at first the power of convergence, though this gradually failed. She showed a remarkable unsteadiness. She could not stand erect, but always leaned back strongly on some support as if she were voluntarily pressing backwards. When she was made to sit up straight in bed she always fell back. When made to lean forwards in bed with her hands on her knees she remained so, but whenever she lifted her hands up her back at once straightened itself. The inference was that she suffered from a tumour situated in the cerebellum as described. The patient became gradually more and more unconscious and a greater degree of blindness ensued until death supervened. There was evidently an obstruction to the outflow of cerebro-spinal fluid from the third ventricle backwards. The post-mortem examination showed the presence of a small tumour of about the size of a bean just below the pineal gland and pressing into the third ventricle. The sections through the brain showed a small lenticular tumour right in the middle line and projecting into the hinder part of the third ventricle, and growing not from the optic tract but from

the grey matter around the aqueduct of Sylvius. The symptoms must have been due to a gradual involvement of the external muscles of the eyeball but sparing those for accommodation. The sixth nucleus had been entirely unaffected. The glioma arising in the grey matter had grown backwards along the aqueduct and upwards into the third ventricle.

Dr. ALEXANDER JAMES read a description of a case of Landry's Paralysis and Dr. R. A. FLEMING gave an account of the pathological conditions present in the case. Dr. James stated that when influenza attacked the nervous system specially all kinds of effects might be produced. It might affect special nerves alone. In three patients admitted into Dr. James's ward within a few weeks of one another, all suffering from influenza, a rapidly produced paralysis extending from below upwards was noticed (Landry's paralysis). One typical case was the following. A young woman, aged 23 years, was admitted to the Edinburgh Royal Infirmary on Jan. 31st, 1900, suffering from pains in the head and back and delirium. The influenza had existed for two weeks previously to her admission and she had also suffered from the same disease seven months previously. The headache had been very severe and before her admission she had suffered much from insomnia, crying out constantly and meaninglessly, and being so noisy that her friends thought of sending her to an asylum. She was sensible at times and complained of the globus hystericus. When first examined on Jan. 31st her temperature was 103° F., her pulse was 130, and her respiration was 22. She would not answer questions, but cried out continuously for hours together. She lay on her back and did not move either her legs or arms. The urine and fæces were passed involuntarily. Sensibility to touch and pain seemed normal. The volitional power of arms and legs was lost. There was no distinct evidence of paralysis of the diaphragm. Cheyne-Stokes breathing was present while the girl was awake, but during sleep the breathing was normal. Both superficial and deep reflexes were absent and the power of swallowing was greatly impaired. Later the breathing became more rapid for perhaps half a minute and then quieter. She complained of pain behind the sternum and the upper lip was noticed not to move well as she spoke. Shortly after this her head shook violently, she became wildly delirious, and died soon afterwards. For about 10 days she exhibited the ordinary symptoms of influenza, then a paralysis gradually spreading from the lower extremities to the nervous centres in the medulla ensued.—Dr. FLEMING described the pathological conditions which were present. Excepting an incipient broncho-pneumonia near the root of the left lung no other marked visceral lesion was present. The liver and kidneys showed cloudy swelling; the spleen weighed only four and a half ounces and was acutely congested with a number of small hæmorrhages. In the brain the dura mater was firmly adherent posteriorly. The grey matter was markedly congested and showed general œdema. The pia and arachnoid mater appeared to be normal. There were no degenerations in the columns of the spinal cord and an examination of the cells gave disappointing results. In the medulla the cells were swollen and in the anterior cornua of the cord the multipolar cells were also swollen. The nuclei of these were distinctly eccentric in position and chromatolysis was present in a considerable degree in these swollen cells. The cells in the anterior horns in the lumbar and cervical regions of the cord showed a marked atrophy but stained deeply, and numerous small microscopic hæmorrhages (really microscopic diapedesis of red corpuscles) not visible to the naked eye were present.

THE ROYAL HOSPITAL FOR INCURABLES AT PUTNEY.—By the death of Mr. William Loney of St. Heliers, Jersey, this hospital becomes entitled to the residue of his estate, which it is estimated will eventually amount to about £14,000.

THE PARISH OF ST. GEORGE'S, HANOVER-SQUARE, AND THE ST. PANCRAS SCANDAL.—In consequence of the recent evidence adduced at the official inquiry into this scandal the Relief Committee of St. George's, Hanover-square, has reported that "the question of gratuities was inquired into in August, 1898, by the Schools and Asylums Committee, and in September of the same year by this committee, and on several occasions since the matter has been before other committees of the board, and we are satisfied that so far as this union is concerned no such practice exists."

Reviews and Notices of Books.

Refraction and How to Refract: including Sections on Optics, Retinoscopy, the Fitting of Spectacles and Eyeglasses, &c. By JAMES THORINGTON, A.M., M.D., Adjunct Professor of Ophthalmology in the Philadelphia Polyclinic. With 200 Illustrations, 13 of which are coloured. London: Rebman Limited. 1900. 8vo, pp. 301. Price 7*s.* 6*d.*

THE number of treatises dealing with the subject of refraction since the appearance of Donders's essay on the Refraction and Accommodation of the Eye, which it is the special glory of the New Sydenham Society to have caused to be written and published, is so great, the details have been so thoroughly worked out and presented to the student in so many forms from the elaborate work of Landolt, who seems to have almost exhausted this branch of ophthalmic work and practice, to the pamphlet of a few pages, that it is difficult for any writer, whatever may be his ability, to say much that is new or to do more than refer to such recent improvements or aids to examination as may have come under his notice.

Dr. Thorington's volume commences with a series of definitions of the terms commonly used in optics, giving brief explanations of incident, emergent, reflected, refracted, divergent, and convergent rays; positive and visual foci; the formation of images; the numbering of prisms, and the forms and action of lenses. In regard to the numbering of prisms the author remarks that formerly prisms were numbered by their refracting angles, but that now other methods are in use known as Dennett's and Prentice's methods. The unit or centrad in Dennett's method is a prism that will deviate a ray of light the one-hundredth part of the arc of the radian. The radian is so much of the circumference of a circle as will equal the length of its radius of curvation. This is called the arc of the radian and equals 57·295 degrees. It is divided into 100 parts, and a prism base down at the centre of curvation that will deviate a ray of light downwards just one-hundredth part of the arc is a one centrad. M. Prentice's method, the unit or prism dioptre, is a prism that will deflect a ray of light just one centimetre for each metre of distance, that is the one-hundredth part of the radius measured on the tangent. The various forms of test cards for the determination of the sharpness of vision and the particulars of the mode of examination of the fundus by the direct and the indirect methods are fully given and there is an interesting chart showing at one view all or most of the different forms of clocks that have been proposed for the recognition of astigmia. The whole chapter on Astigmatism is well written, the author describing no less than 15 methods for its discovery. These are: corneal reflex, confusion letters, Placido's disc, stenopœic slit, astigmatic chart, the pointed line test, perforated chart or disc, Pray's letters, Schriner's test, chromo-aberration or cobalt-blue test, Thomson's ametrometer, the ophthalmometer, direct ophthalmoscopy, cylinder lenses, and retinoscopy, and yet with all these mutually supporting or corrective methods mistakes sometimes occur.

The etymology of the various terms in use is given, and in general correctly, but there are some oversights. Thus the derivation of "ametropia" is given ἀ priv., μέτρον, "a measure"; ὄφις, "sight," instead of ὤψ or ὄψις; and on the next page "hyperopia" is derived from ὑπέρ, "over"; ὤφ, eye, and the same error is repeated under "anisometropia." Pince-nez is spelt "pinc-nez." The reader will find some useful information not usually given in similar treatises in regard to bifocal lenses and spectacle frames. The book will prove serviceable to those who are dressers and house

surgeons in ophthalmic wards or to practitioners who wish to familiarise themselves with the modern methods of correcting ametropia.

Commercial Organic Analysis. Vol. II., Part II. By ALFRED H. ALLEN, F.I.C., F.C.S. Third edition, with revisions and additions by the Author and HENRY LEFFMAN, M.A., M.D. Philadelphia. London: J. & A. Churchill. 1900. Pp. 330. Price 14*s*.

IT was inevitable that Mr. Allen's valuable series of volumes on Commercial Organic Analysis should sooner or later have to undergo revision. The progress of analytical chemistry is so rapid as soon to render published methods either obsolete altogether or unsatisfactory in some respect. The work as a whole, indeed, is chiefly valuable because in reality it consists of a trustworthy record of modern analytical processes as applied to those substances which come under the classification of the title of the work. Moreover, Mr. Allen's experience as an analytical and consulting chemist gives him the position of being able to confirm or disprove any given process in vogue. Thus he frequently records his own experience of various analytical processes which when he has found them unsatisfactory he has set to work upon with the view of making them more reliable and perhaps at the same time more expeditious. In this task he has met with considerable success. The volume under notice deals with the very important class of bodies—hydrocarbons, petroleum and coal tar products, asphalt, phenols, and creosote. There are, therefore, chapters in it which relate to the purity of many antiseptics employed in medicine and in sanitation. The valuation of a given antiseptic by bacteriological methods is not described, though we think a short chapter on this subject would have been useful to the practising analyst. The chapter on Petroleum and Shale Products, as well as the chapters on Coal-tar Derivatives, are most valuable. Obviously the present volume deals with the petroleum question in its relation to a legalised flash-point. Mr. Allen points out that all petroleum with a flash-point above 73° F. was by the Act of 1879, and contrary to the 1871 Act, freed from legislative restriction. The purpose of a Bill now (1899) pending in Parliament, he adds, is to substitute the accurate or close test for the inaccurate or open test in the Act of 1871 and to restore the 100° flash-point prescribed by that Act. Though this very accurately and simply defines the position we doubt whether an Act will ever be introduced which will seriously interfere with the sale of petroleum, which is being sold without restriction at the present time. Again, opinion is very much divided as to whether this interference is needed.

The work is one which is indispensable to the analyst, while chemists generally will consult its pages with advantage and confidence.

Micro-organisms and Fermentation. By ALFRED JÖRGENSEN. Translated by A. K. MILLER, Ph.D., F.I.C., and A. E. LEMMHOLM. Third Edition. London: Macmillan and Co. 1900. Pp. 318. Price 10*s*.

WE have before remarked upon the extraordinary economic influence which a study of the habits of micro-organisms is bringing to bear upon several great industries; indeed, it is not too much to say that as our knowledge of fermentative processes has deepened so has sprung up a complete reformation in many industrial processes in which the action of micro-organisms is so intimately concerned. After all, the application of this kind of knowledge is quite old in principle, as must be admitted in the cases of horticulture and agriculture, for, in the last words of the volume before us, "in order to obtain the desired species of plant its seed should be sown free from the seed of all other plants." It was Hansen of the Carlsberg laboratories who first showed that by cultivating a pure yeast a uniform product, whether wine or beer, could be obtained, and the results of this important discovery are now applied on a manufacturing scale in breweries, distilleries, and in the preparation of wines from the grape and other fruit. Nor have Hansen's discoveries stopped here, for pure cultures of lactic acid bacteria have been successfully employed for the souring of cream on a large scale much in the same way as pure yeast has been employed for the manufacture of sound beer. Again, very important experiments have been obtained with encouraging results in tobacco fermentation with the view of producing a definite aroma in tobacco leaves by the addition during fermentation of pure cultures of certain species of bacteria. It is all, in a word, a question of the cultivation of species, the separation of the weed, so to speak, from the true seed. This is the alpha and omega of the work before us. Mr. Jörgensen is a director of the laboratory for the physiology and technology of fermentation at Copenhagen, and his work is therefore closely associated with the classic researches of Hansen of the Carlsberg laboratories. The present volume, it is not surprising to find, is the third edition. The work of revision has been brought into line with modern knowledge. The illustrations are 83 in number, but though true to the original subject they have no special merit of an artistic kind. The work of translation is well done, and a clearer account of the subject we have not had the pleasure of reading. The book is eminently practical in character and thus appeals, as the author states, to chemists, botanists, and biologists, and likewise to those technologists who are engaged in the fermentation industries. Mr. Jörgensen is well known as a most active worker in the direction of the biology of yeasts in its application to industrial processes. His book is therefore not only an excellent text-book for the man who requires to study the subject practically, but it is also educational in another direction, since it contains accounts of the results of his researches during recent years on many interesting aspects of the methods of cultivation. The book opens with chapters on the apparatus used in bio-technical work and an account of the methods of examination. In fine the author grapples with his subject in that clear and intelligible manner which admirably justifies the work being regarded as an excellent laboratory companion on this special branch of bacteriology which might be called "bio-technology."

Richter's Organic Chemistry. Edited by Professor R. ANSCHUTZ. Authorised translation by EDGAR F. SMITH, Professor of Chemistry, University of Pennsylvania. Third edition from the eighth German edition. Vol. II., Carbocyclic and Heterocyclic Series. London: Kegan, Paul, Trench, Trübner, and Co., Limited. 1900. Pp. 671. Price 15*s*.

THERE is something to be said in favour of the classification of the carbon compounds which Victor von Richter has adopted in his classic work. In Vol. I, which was reviewed in THE LANCET of May 27th, 1899, p. 1436, the author dealt with the chemistry of the aliphatic series—that is, with the so-called fatty compounds. In the present volume he deals with carbocyclic compounds—that is, compounds containing closed carbon chains or rings. In general these are also isocyclic compounds, because they consist of rings of atoms of one or the same element, as distinguished from heterocyclic compounds which may be regarded as ring skeletons consisting of atoms of various elements. Thus we have a sharp classification of the whole of the compounds known to us which come under the generic term "organic." The alkaloids and a great number of the active principles of plants used in medicine come obviously under consideration in the present volume. The work, however, deals with theoretical rather than with practical considerations, and since von Richter is one of the greatest authorities on classification and constitution the work is one for acceptance. No subject

could be wider than that of organic chemistry, but to deal with it as the author and translator have done within the compass of the comparatively small size of these two volumes is an achievement which has its demerits as well as its merits. Every conceivable space on the pages has been utilised, the paragraphs are very much crowded, and the type generally is very small. On this account the classification of the various compounds does not appear to be as distinct as would have been the case had the volumes been larger and the printed matter less congested. The preparation of the work from the point of view of the printer must have entailed enormous labour and care with proof-sheets. The work, of course, is a standard one, considering the very high position which the author holds as one of the best exponents of the "organic" side of chemical science.

JOURNALS.

The *Veterinarian* for July is an improvement on its predecessor of the previous month, although original articles from English practitioners are still wanting. Summaries are given from colonial reports upon Actinomycosis and Tuberculosis in New Zealand Cattle, the original work having been done by, or under the supervision of, Mr. J. A. Gilruth, M.R.C.V.S. There is an interesting extract from an American journal upon the subject of Oöphorectomy of the Mare, the operation being done per vaginam, the way now almost universally practised. The Glasgow Tramways and Omnibus Company have recently carried out some valuable investigations into the use of mallein as a curative agent in cases of glanders and their conclusions are given in full. Under the "Month's Progress" there are a number of scientific extracts, those bearing upon the latest researches into rabies raising great hope that a rapid method of forming an early and certain diagnosis after the death of the suspected animal can be made. According to work done by M. Nocard of Alfort and also by Cuillé and Vallée of Toulouse the results of the researches of van Gehuchten and Nélis must not at present be absolutely accepted, and whatever opinion is given from a microscopical examination the duty of the veterinary expert is to advise the person bitten to proceed at once to the Pasteur Institute.

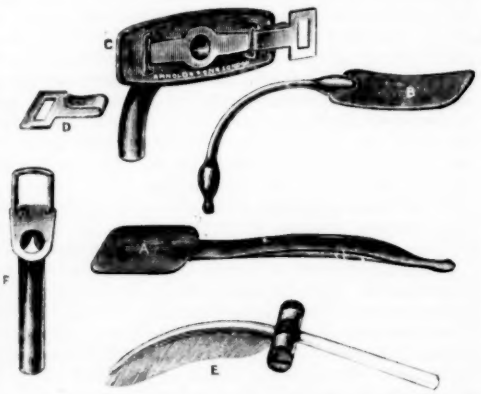
THE SANITARY INSPECTORS' ASSOCIATION.—The annual meeting of the western branch of this association held its annual meeting at Dartmouth on July 7th. The mayor read a paper on the Disposal of House Refuse and the medical officer of health (Mr. J. H. Harris), in the course of an interesting address upon the position of sanitary inspectors said that such inspectors should be officials of the Local Government Board, appointed and salaried by that body instead of the local authority, so that they could be thoroughly independent. The mayor afterwards entertained the members at dinner.

HOUSING AND IMPROVEMENT ASSOCIATION.—A conference was held recently in Hulme "to consider the housing question as affected by the past clearance of low-rented houses and the threatened closing by the Sanitary Committee of the Manchester Corporation of many more, because of their alleged unfitness for human habitation." It was attended by many representative people. Resolutions were passed appreciating the action of the City Council in declining to sanction the further closing of houses in Hulme till provision has been made for those displaced, and yet assuring the Sanitary Committee of its support if they will only build as they pull down. The landlord of some of the condemned property brought forward a very familiar argument that there had been no infectious disease in that property for 20 years, and said that "there was too much of this pulling houses down." Such statements are always made where the death-rate is highest. The conference was constituted a permanent Housing and Improvement Association, and may, it is hoped, do useful work.

New Inventions.

NEW TRACHEOTOMY INSTRUMENTS.

THE dilating director A is inserted by the side of the knife before the latter is withdrawn from the trachea; on turning it transversely it both dilates the wound and serves as a director for the tube. The pilot B is original only in its probe point. The outer tube C is shaped like Parker's but has larger wings. The tape holders D are hooked on to the bars of the shield before use; they prevent the tube from being coughed out but allow it free movement. The cleaner E, of stiff plumed feather, is guarded by two little ebonite bars united by rubber rings and adjusted to the length of the tube. It is easily sterilised and cannot reach the



trachea. Where an inner tube is necessary the pattern F is used. Like Durham's it is self-retaining without key. The single handle is placed in the position of greatest mechanical advantage and taken well out of the way. As there is room for a finger on either wing of the outer tube the latter can and should be fixed during the removal of the inner and is then not jogged about in the trachea, nor can it be pulled through the shield. There is nothing about the orifice of the tube or within it likely to catch dirt, every part is readily taken to pieces for cleaning, and the tapes being inserted without any disturbance of the shield are not introduced until all is clean. Messrs. Arnold and Son are the makers.

G. C. GARRATT, M.B. Cantab.,
Assistant Resident Medical Officer at the London Fever Hospital.

AT the meeting of the general committee of the French Hospital, London, on July 12th, Dr. George Ogilvie was unanimously elected physician to the hospital. The committee cordially expressed their appreciation of his services during the past year when acting for Dr. J. S. Keser during his absence abroad.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.—A quarterly court of the directors of this society was held on Wednesday, July 11th, the acting treasurer, Dr. Potter, being in the chair. One new member was elected, the deaths of three members were reported, and three persons had ceased to be members since April last. The death of a widow who had received £35 a year since 1886 was announced. An application for grants for herself and seven children was read from a widow, and grants at the rate of £100 a year were made. The husband, who met with a fatal accident in Australia, had only been elected a member in 1891 and had paid 18 guineas in subscriptions. A sum of £1197 was voted for distribution among 48 widows, 14 orphans, and six recipients from the Copeland Fund. The expenses of the quarter were £44 12*s*. A vote of "God-speed" was passed to Dr. W. S. Church, one of the treasurers of the society, on his appointment on the commission of inquiry into the working of the hospitals in South Africa.

REPORT OF

The Lancet Special Commission

ON THE

METROPOLITAN WATER-SUPPLY

THE QUESTION OF CONTROL.

I.—THE HISTORY AND DEFINITION OF CONTROL.

The Control of the Metropolitan Water-supply: Introductory; An Ideal Supply of Water for London; Recent Royal Commissions on the Metropolitan Water-supply.—Definition of Control: Control of the Water-supplies in Mediæval London; The Earliest Example of Financial Control; Control with Regard to Smoke; Competition amongst the Water Companies, "Reasonable Charges"; Complaints in Respect of Charges; Complaints in Respect of Quality; New Supply or Efficient Control?

THE CONTROL OF THE METROPOLITAN WATER-SUPPLY.

Introductory.

THERE is perhaps no matter of greater importance to the people of London than the question of their present and future water-supply. During the last few years the East London Waterworks Company have on more than one occasion failed to give an adequate supply to their customers and about two years ago the Lambeth Waterworks Company for a time also failed to give a continuous supply to the people who lived within their Parliamentary area; and although it is provided that the metropolitan water companies shall be fined should they fail to give a continuous supply, in the case of neither of these companies, as far as we are aware, has any serious effort been made to punish them for their neglect of their statutory duties. Some of the other companies have given their customers no reason to complain, but the fact that parts of the London district have been inadequately supplied has once more brought into prominence the whole question of the metropolitan water-supply as it at present exists. In the case of a rapidly spreading city like London, however, a knowledge of the present requirements is not sufficient; it is necessary to look forward to the future.

An Ideal Supply of Water for London.

An ideal supply of water for London would ensure that the quality of the water should be pure and derived from sources beyond the suspicion of pollution; and that the quantity should be adequate not only for domestic supplies, but sufficient to give an unstinted amount for municipal purposes. The public fountains would not be allowed to run dry, the ornamental waters of London (the Serpentine and the ponds in Regent's Park) and the canals would be clear and bright—a state of things which could only be made possible by frequent change of the water, necessarily involving a supply greatly in excess of that which obtains to-day. The Thames, also, should not be allowed to suffer from excessive depletion and it would be far better if its whole natural flow and the whole flow of the Lee were allowed to pass down to cleanse and scour out the lower reaches of the river. Whether London will ever have such a supply in the future the future alone will show. A scheme which would give such results has yet to be devised, and if it were devised it would take many years to carry out.

Recent Royal Commissions on the Metropolitan Water-supply.

The question as to whether the people of London should obtain their supply of drinking water from some pure source at a distance is one upon which at present there is difference of opinion and it is not likely that the question will be settled until the amount of the present sources of supply is definitely known. It cannot at present be said that we are in possession of complete and accurate information on this matter. More than one Royal Commission on the subject of the London water-supply has, it is true, investigated the subject, but it is to be feared that the results of the investigations have not been thoroughly satisfactory, although the time occupied in making them has been very considerable and the expenses incurred have been by no means small. Many of the more thoughtful people of London are regretfully coming to the conclusion that the members of the present Government who have been responsible for the appointment of the last two Royal Commissions on the metropolitan water-supply have adopted this method of proceeding rather with a view to evade for the time their own responsibilities in matters which have been "under investigation"; and the somewhat cynical remarks on the alcohol question lately made by Lord Salisbury with reference to the Licensing Commission Report have given countenance to this opinion. It is also feared that the choice of the members of a Royal Commission is sometimes made rather with a view to avoid criticism than with any hope that the members selected will seriously do their best to get to the bottom of the problem which they are called upon to solve. On such occasions "vested interests" are by no means always ignored.

Lord Balfour's Commission reported on the quantity of water which was available in the valleys of the Thames and the Lee. Unfortunately the figures which were given to the Commission have, as we shall see, proved to be erroneous. It therefore follows that the report on the available quantity of water is not entirely reliable.

Lord Llandaff's Commission were instructed to investigate the financial expediency of purchase of the metropolitan water companies' undertakings and were asked to advise as to whether it would be well for the water-supply to be placed under the care of one or more authorities, and if so, as to

what authority should be empowered to undertake the management, should the purchase of the present companies' undertakings be considered advisable. They were asked to report also as to whether any additional measures of control of the water undertakings were needed.

A great part of the evidence given at Lord Llandaff's Commission had reference to the expediency of purchase and dealt with the financial history and the present state of the eight metropolitan water companies. Anyone who may read and digest all the evidence carefully must entertain grave doubts as to the expediency of purchase from the point of view of the water consumer, even if, as Lord Llandaff's Commission assumed, the present sources of supply will be sufficient for many years to come. It may also be pointed out that the metropolitan water companies, as far as they themselves are concerned, are entirely opposed to an amalgamation of the different businesses into one organisation; that is to say, the engineers and directors of the companies who are naturally the persons most intimately acquainted with the working of their own businesses are decidedly of opinion that they are better carried on as separate entities than they would be under one central management. This in itself is a strong argument against placing the present undertakings under one management. The opinion of the engineers and directors of the water companies is formed with a thorough knowledge of all the facts of the case and there are many details of administration and difficulties of organisation known to them which are not by any means common knowledge and which are probably neither appreciated nor even suspected by some of the people who think that under any circumstances the mere possession of a number of different businesses by one Board could ensure unity of management. "Unity of management" is a well-sounding phrase, but a well-sounding phrase will not alter physical facts. The possession of the water mains of two companies by the same Board will not cause unity of pressure of the water conducted through the mains. The pressure in the pipes will depend on the same physical causes whoever be the owner of the pipes. The fact that the metropolitan water companies differ in the details of their method of supply renders it physically impossible that "unity of management" could be of any value or could become an effective fact without a great many changes in the plant and apparatus used for the distribution of the water. A real "unity of management" as understood by those who glibly use the phrase, therefore, must necessarily involve a large outlay—a point which they apparently have not grasped with equal tenacity. A careful study of the Llandaff report throws very great doubt on the financial expediency of purchase even if the Thames and Lee be able to give a sufficient supply of water. The report shows that the Commission had, as a matter of fact, considerable doubt as to the future cost of the London water-supply, and that they did not disguise from themselves the real danger of financial disaster which might ensue to the buyer. This fact is shown clearly enough by the powers for obtaining money which they suggested should be conferred on the Board which they proposed should be empowered to carry on the work of the present undertakings. No consideration of the question of a new Water Board would be complete if no account were taken of the fact that the representatives of the metropolitan counties are entirely opposed to the formation of such a Board and to the purchase of the present water companies' undertakings. There is no doubt that very considerable opposition would arise if any attempt were to be made by the Government to carry out the recommendations of the Llandaff Commission for the formation of such a Board. The question is a large and intricate one, and up to the present time there is a lack of accurate information in regard to the water-bearing capacities of parts which are within the area of Water London. It would be a waste of time for Parliament in the present state of knowledge to attempt any legislation dealing financially with the water-supply of London. It by no means follows that nothing at all should be done. On the contrary, it is highly desirable that information which is at present lacking should be collected and weighed and it is necessary that this should be done before any final decision is arrived at with regard to the future sources of the water-supply of London. This information can only be obtained by instituting additional measures of control over the metropolitan water companies. Up to the present time the companies' witnesses who have appeared before the Royal Commissions have been extremely reticent and no information has been given with regard to the effect of pumping on the wells of the companies.

DEFINITION OF CONTROL.

In the evidence which he gave before Lord Llandaff's Commission Mr. Whitmore, Member of Parliament for Chelsea, who was also a member of the London County Council, said that he had given a great deal of attention to the question of the metropolitan water-supply, and in the course of a lengthy oration he said that he had never been able to understand what control as applied to water companies means. In the following pages an attempt has been made to explain what measures of control at present exist and what new measures of control are desirable.

Briefly stated control as applied to the metropolitan water companies means that some superior authority should have statutory powers to enforce obligations which have been imposed by law on the companies which supply the water. Powers of control already exist in regard to the financial management of the water companies, in regard to the quantity and quality of the water supplied by them, and in regard to the charges they are allowed to make to their customers. Additional powers of control have been recommended by the Balfour and Llandaff Commissions, but up to the present time the Government has made no attempt to translate these recommendations into statutory life.

Control of the Water-supplies in Mediæval London.

The origin and history of the control exercised over the supply of water for the people of London can be only briefly sketched. Until the reign of Elizabeth the citizens of London obtained their water either from the river, from springs or wells, or from the public conduits. The conduits were the property of the City of London, and regulations were made by the Corporation in regard to the time and manner in which water could be obtained from them. The keepers of the conduits were removeable at the discretion of the civic authorities. A small amount of water was sold to brewers and other tradesmen, and a few noblemen had "quills" or small pipes laid on from the public mains for the supply of their houses, and for this accommodation it does not appear that any charge was made. The greater part of the water was distributed gratuitously but those who wanted it had either themselves to carry it away from the public conduits or to buy it from those who made it a business to carry it round to private houses. Briefly, at this time the control of the water-supplies in the City was in the hands of the Corporation of London.

At the end of the sixteenth century (1581) a lease of one of the arches under London Bridge was granted to an engineer for the purpose of putting up a water-wheel to pump from the Thames. This venture was subsidised by the city authorities and the water was supplied to some of their conduits. The profit of the undertaking, which was a private enterprise, was derived from the rents paid by those to whose houses the water was laid on. The price paid was a matter of bargain. Early in the seventeenth century (1613) the water of the New River was brought to London and was soon afterwards distributed to the houses of those who were willing to pay for it. In this case, also, the price paid was purely a matter of arrangement between the buyer and the seller. The city conduits were still supplied with water but the amount was inadequate, and James I., who was the chief shareholder in the New River undertaking, did not encourage either the introduction of new supplies or the repair of the conduits which belonged to the City and which served to bring the water from the distant springs. The public supplies fell off, and finally the Great Fire hopelessly damaged the leaden pipes and cisterns.[1]

The Earliest Example of Financial Control.

The earliest example of control which occurs in the history of the metropolitan water companies is probably a section of an Act of the Chelsea Company (8 Geo. I., cap. 26) which prohibited dealing in the shares until the works undertaken

[1] The conduits, according to a contemporary authority, "stood like so many little but strong forts to confront and give check to the great enemy; and as enemies are wont to deal with castles, thought impregnable, by attempting to carry them by storm, so went the fire to work with these little castles of stone, which were not easy for it to burn down ..... and spoiled them, or almost spoiled them, by melting the leaden channels through which their supplies of water came."

by the company were completed, "and for preventing all sinister practices or abuses of this Act ..... it shall not be lawful for any person or persons whatsoever having any stock or share in the said undertaking to transfer or assign the same before or until such time as water be brought into the grand reservatory or reservatories intended to be at or near Oliver's Mount."

Control with Regard to Smoke.

It may not be without interest to note that one of the earliest measures of control contained in an Act of a metropolitan water company had reference to the consumption of smoke. The Grand Junction Waterworks Company was incorporated (51 Geo. III., cap. 169) to supply the parish of Paddington and the parishes and streets near, and a section of the Act provided that every furnace used by the company should consume its own smoke and every chimney should have its shaft at least 130 feet above the ground level, and that the smoke issuing therefrom should not at any one time exceed the quantity of smoke usually issuing from the chimneys of 24 fires for domestic uses.[2] It was provided that any chimney or furnace belonging to the company which broke this regulation might be dealt with as a common nuisance. The Act contained also provisions forbidding the erection of a furnace or steam-engine within a quarter of a mile of Edgware-road without the sanction of Mr. Edward Berkeley Portman. Another provision in the Act had reference to the water rents chargeable by the company to the effect that tenants on the Bishop of London's estate at Paddington were to have a reduction of 10 per cent. on the average rates paid by other customers.[3]

Competition amongst the Water Companies: "Reasonable Charges."

During the early part of the present century there was keen competition between the new companies which had then lately arisen—the West Middlesex and the Grand Junction—and the older companies—the London Bridge, the New River, the York Buildings, and the Chelsea. The new companies offered water at higher pressure and at a reduced price. The amount charged was a matter of bargain. The West Middlesex Company according to the terms of their Act were allowed only to make reasonable charges, but the meaning of the word "reasonable" was left to the discretion of the company. During the height of the competition there was an acrimonious correspondence between the New River Company and the West Middlesex Company (1811-12), but soon afterwards (1815) a Bill was introduced into Parliament for the amalgamation of these two businesses. The metropolitan water companies had found it inconvenient to undersell one another and they ultimately agreed amongst themselves to partition the town between them so that there should be no longer any active competition.

Complaints in respect of Charges.

The amount charged for water was immediately raised by all the companies and between the years 1810 and 1821 the increase in the water rentals amounted to about 25 per cent. A Parliamentary committee which investigated the complaints which were made on this score reported that in every instance the rentals were left solely to the agents of the different companies to charge as they should think fit and that the charges were not regulated either by the quantity of water consumed or by the distance to which it was conveyed. After the reception of the Parliamentary report in 1828 Mr. Peel, who was at the time Home Secretary, suggested that if the public were dissatisfied a new company would arise. He did not wish to encourage such a speculation; he did not indeed think it would be well for the Government to interfere or to appoint engineers to suggest the manner in which individuals (water company shareholders) should manage their own property.

Complaints in respect of Quality.

The prices charged by the companies formed the first ground of grievance which the public thought they had against them, but at a later period the quality of the water aroused somewhat general disapproval. The spread of cholera was distinctly traced to the water-supply and when this fact was at length thoroughly realised there was a general feeling that the public had not been well treated.

New Supply or Efficient Control.

The question arose as to whether a new supply should be obtained and placed under the Board of Health, but finally the action of Parliament was decided in accordance with advice given by Lord Seymour (1852) whose opinion was that all it behoved Parliament to do was to provide for an efficient control over the companies so that water should be supplied good in quality, sufficient in quantity, and at a cheap rate. The companies, he said, had better be left to act separately or in conjunction as they should find best.

The Metropolis Water Act was passed in the year 1852. Under this enactment provisions were made with regard to the quantity and quality of water which the companies were called upon to supply and during the same year arrangements were made by which within a certain time the intakes of the companies from the Thames were to be moved to points higher up the river than the places from which the water had previously been taken.

After the year 1852 the next important general Act which dealt with the metropolitan water-supply was that of 1871 which provided for the appointment of a water examiner and altered the regulations under which a continuous service of water could be insisted on by the inhabitants of the metropolitan area. In the year 1887 an Act was passed giving increased power to local authorities in regard to questions of control. These regulations are given fully in the pages which follow.

II.—THE EXISTING STATUTORY PROVISIONS FOR CONTROL.

Obligations of Water Companies to Lay Mains and to Provide and Supply Water for Domestic Purposes: Supply of Water for Domestic Purposes; Provisions as to Water Rates; Provisions as to the cutting off Supplies; Constant Supply for Domestic Use; Constant Supply for Municipal Purposes.—Control now exercised in respect of Quality, &c.: Quality and Quantity, Regulations concerning Reservoirs and Aqueducts; Water Examiner; Prevention of Waste, Misuse, and Contamination of Water; Accounts and Audit of the Water Companies' Businesses; Limitation of the Dividends of the Companies.

THE statutory provisions with regard to control of the metropolitan water companies undertakings have reference to—1. The obligation to lay mains and to provide and supply water throughout their districts. 2. The obligation to supply the water in sufficient quantity and of good quality. 3. The financial management of the undertakings and the amount which they are allowed to charge for the water which they supply.

In the account which follows of the provisions for control which now exist a statement given by Mr. E. A. Bonnor-Maurice to the Llandaff Commission has been closely followed and the sections of the general Acts of Parliament in which the provisions with regard to control are contained are in most cases quoted *in extenso*. In the case of the private Acts of the companies references are given to the sections of the Acts which bear on the subject, and in all these cases either the exact words or the gist of the section referred to are given. The interpretation of the Acts put in by Mr. Bonnor-Maurice gave rise to a little discussion between the members of Lord Llandaff's Commission and some points which were raised will be briefly noted in their proper place.

[2] It need hardly be said that since the date of that Act (1811) the regulations made with regard to smoke have been made very much more stringent.

[3] The Bishop of London was the owner of land from which water was formerly obtained by the Corporation of London for the supply of the City. The spring was situated near the Bayswater-road.

OBLIGATIONS OF WATER COMPANIES TO LAY MAINS AND TO PROVIDE AND SUPPLY WATER FOR DOMESTIC PURPOSES.

The companies are required to cause main pipes to be laid down and pure and wholesome water to be brought to every part of the district within the limits of supply on the requisition of so many owners and occupiers in that part of the district so that the aggregate amount of water-rates payable by them annually at rates specified in the Acts of Parliament of the respective companies shall be not less than one-third part of the expense of providing and laying down such pipes: provided that no such requisition shall be binding on the companies unless those owners and occupiers severally execute agreements binding them to take a supply for domestic purposes for three consecutive years.

The sections in the private Acts of the metropolitan companies which refer to the laying of mains and the provision of water are not identical. The Kent Company have no Act which contains specific provisions bearing on these matters. In the case of the other companies the provisions are as follows:—

The *New River* (15 & 16 Vict., cap. 160, sec. 34), the *Grand Junction* (15 & 16 Vict., cap. 157, sec. 40), the *Southwark and Vauxhall* (15 & 16 Vict., cap. 158, sec. 47), and the *West Middlesex* (15 & 16 Vict., cap. 149, sec. 33) companies have each and all the following statutory provision:—

> The company shall cause main pipes to be laid down and pure and wholesome water to be brought to every part of the district within the limits of this Act, whereunto they shall be required by so many owners or occupiers of houses in that part of the district, as that the aggregate amount of water-rate payable by them annually at the rates specified in this Act shall not be less than one-tenth part of the expenses of providing and laying down such pipes: Provided always that no such requisition shall be binding on the company unless such owners or occupiers shall severally execute an agreement binding themselves to take such supply of water for three successive years at least: Provided also that the company shall not be bound to provide or lay down any communication pipes for any such supply of water except at the expense of the persons requiring the supply: Provided also that the company shall not be bound to furnish any such supply of water or lay down any pipe for such purpose in any part of the district which part is, for the time being, supplied with water by any other company.

The *Chelsea Company* (15 & 16 Vict., cap. 156, sections 64 and 65) and the *East London Company* (16 & 17 Vict., cap. 166, sections 57 to 61) are each controlled by the following regulation:—

> That the company shall cause main pipes to be laid down, and pure and wholesome water to be brought to every part of the district within the limits of this Act, whereunto they shall be required by so many owners or occupiers of houses in that part of the district as that the aggregate amount of water-rate payable by them annually at the rates specified in this Act shall be not less than one-tenth part of the expense of providing and laying down such pipes: Provided always that no such requisition shall be binding on the company unless such owners or occupiers shall severally execute an agreement binding themselves to take such supply of water for three successive years at least: Provided also that the company shall not be bound to provide or lay down any communication pipes for any such supply of water except at the expense of the persons requiring the supply: Provided also that the company shall not be bound to furnish any such supply of water or lay down any pipe for such purpose in any part of the district which part is, for the time being, supplied with water by any other company.
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> That if for twenty-eight days after demand in writing made to the company and tender made of an agreement signed by such number of owners or occupiers as aforesaid, to take and pay for a supply of water for three years or more, the company shall refuse or neglect to lay down pipes in the manner hereinbefore directed, and to provide such supply of water as aforesaid, they shall forfeit to each of such owners and occupiers the amount of rate which he would be liable to pay under such agreement, and also the further sum of forty shillings for every day during which they shall refuse or neglect to lay down such pipes or to provide such supply of water: Provided always that the company shall not be liable to any penalty for not supplying water if the want of such supply shall arise from frost, unusual drought, or other unavoidable cause or accident.

The case of the *Lambeth Company* is somewhat different. Under the Waterworks Clauses Act, 1847, sections 35 and 36, the following clauses (which are not incorporated by the other companies) are in force:—

> The undertakers shall provide and keep in the pipes to be laid down by them a supply of pure and wholesome water sufficient for the domestic use of all the inhabitants of the town or district within the limits of the special Act, who, as hereinafter provided, shall be entitled to demand a supply, and shall be willing to pay water rate for the same, and such supply shall be constantly laid on at such a pressure as will make the water reach the top storey of the highest house within the said limits, unless it be provided by the special Act that the water to be supplied by the undertakers need not be constantly laid on under pressure, and the undertakers shall cause pipes to be laid down and water to be brought to every part of the town or district within the limits of the special Act, whereunto they shall be required by so many owners or occupiers of houses in that part of the town or district as that the aggregate amount of water rate payable by them annually at the rates specified in the special Act shall be not less than one-tenth part of the expense of providing and laying down such pipes: Provided that no such requisition shall be binding on the undertakers unless such owners or occupiers shall severally execute an agreement binding themselves to take such supply of water for three successive years at least.
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> If, for twenty-eight days after demand in writing, made to the undertakers, and tender made of an agreement signed by such number of owners or occupiers as aforesaid, to take and pay for a supply of water for three years or more, the undertakers shall refuse or neglect to lay down pipes in the manner hereinbefore directed and to provide such supply of water as aforesaid or as provided by the special Act, they shall forfeit to each of such owners or occupiers the amount of rate which he would be liable to pay under such agreement, and also the further sum of forty shillings for every day during which they shall refuse or neglect to lay down such pipes or to provide such supply of water: Provided always that the undertakers shall not be liable to any penalty for not supplying water if the want of such supply shall arise from frost, unusual drought, or other unavoidable cause or accident.

During the sixtieth sitting of Lord Llandaff's Commission (which was held on March 14th, 1899) a rather interesting discussion arose with regard to the interpretation of this clause. The late Major-General Scott asked Mr. Bonnor-Maurice whether he could tell him if a water company having neglected to provide storage to meet the ordinary increase of supply which is always required in a dry summer and if in that particular summer there happened to be an unusual drought the company would be exempted under this section of the Act on a default of that kind. Mr. Bonnor-Maurice said he thought that the question would be decided according to the facts of the case. The Act said frost or unusual drought. If the company could show it was frost or unusual drought which caused the deficiency they would be exempt. "But," he added, "this question is one which is at the present moment before the law courts in the form of an application by the Hackney Vestry against the East London Company." Major-General Scott asked the witness to state what the question exactly was and the witness, in reply, said it was as to whether if the company could by reasonable forethought have foreseen the drought they ought to have prepared for it. Mr. Pember, who appeared as counsel for the East London and some of the other water companies, interposed by asking whether there would not be the question as to the exercise of reasonable foresight and if the company had taken reasonable precaution whether that plea would avail against the words of the section of the Act which had been quoted. Major-General Scott said that a company might be so much short in their provisions that they might in an ordinary dry summer fail to give a constant supply for six weeks perhaps. Assuming, then, that an unusual drought occurred in that year or in any year which caused them to fail in their supply for four months instead of six weeks, could they plead an unusual drought? Mr. Bonnor-Maurice replied that he thought the plea might be admissible, but in that case the *onus probandi* would be thrown upon the company to show that the want of the usual supply arose from unusual drought. The company were bound to take reasonable precautions to meet as far as they could what could be reasonably expected in the future. If they failed to do that there might be some question as to whether they would be liable; but if, on the other hand, they could distinctly bring themselves within the section that the want of supply arose from unusual drought, the exemption would apply. Major-General Scott said that in the suppositious case that he gave the assumption was that the reservoirs of the company were so deficient that six weeks' failure would have arisen as the result of an ordinary drought in an ordinary summer. Mr. Bonnor-Maurice said that he imagined that the company would not be able to plead that the deficiency of supply arose from an unusual drought if the failure occurred under such conditions. Lord Llandaff remarked that if he understood Major-General Scott aright the question was, supposing a company had failed in exercising reasonable forethought and then there supervened one of the statutory extraordinary contingencies, did the supervention of frost, drought, or unusual accident excuse them from what would be otherwise an undoubted default? In short, Major-General Scott was suggesting that a case of supervening drought might cover, as it were, and excuse the preliminary default. Mr. Pember said that if he were the judge he should say that he was not going to try the issue of what would have happened if there had not been a drought. There was no drought, and what they wanted was the real exciting cause. Mr. Pope, Q.C., who appeared for the New River Company and the Southwark and Vauxhall Company, pointed out that the words of the section "or other unavoidable cause or accident" referred, he thought, to the provisions expressed. It must be a default which could not reasonably

be provided against. For example, in the case of a culvert which a company were bound to provide under a railway the culvert must be sufficient to take all reasonably anticipated floods, but if a flood greater than ever before known should arise and sweep away the whole of the culvert there was no liability on the part of the company because the accident was unavoidable, inasmuch as the flood was greater than it was reasonably necessary to provide against. Mr. Pember said that he might have to argue a case like that which had been referred to by Major-General Scott, and Lord Llandaff remarked that he thought the Commission could not decide these nice questions on points of law.[4]

In their report, however, the Commission advise (p. 71) that "it should be made clear that 'frost, unusual drought, or unavoidable accident,' would not excuse a failure of supply, if it be shown that the failure occurred because the works of the company were not in an efficient condition and have not sufficient reserve capacity of supply."

Supply of Water for Domestic Purposes.

At the request of any owner or occupier (who shall have laid the communication pipes between the companies' mains and the premises to be supplied, and paid or tendered the water rate) of any house in any street within the limits of supply in which any pipe of a company shall be laid, or of any person who is entitled to demand a supply of water for domestic purposes, the company is required to furnish to such person a sufficient supply of water for his domestic purposes, at the rates specified in the Acts of Parliament of the respective company.

The special obligations of the metropolitan water companies to furnish a supply of water to the inhabitants of their authorised areas of distribution are as follows:—

Lambeth (11 Vict., cap. 7, sec. 37).—And be it enacted that the company shall, at the request of the owner or occupier of any house or part of a house in any street within the limits of this Act in which any pipe of the company shall be laid, or of any person who, under the provisions of this Act or any Act incorporated therewith, shall be entitled to demand a supply of water for domestic purposes, furnish to such owner or occupier or other person a sufficient supply of water for their domestic uses, at the rates hereinafter specified.

Chelsea (15 & 16 Vict., cap. 156, sec. 60).—That the company shall, at the request of the owner or occupier of any house in any street within the limits of this Act in which any pipe of the company shall be laid, or of any person who, under the provisions of this Act or any Act incorporated therewith, shall be entitled to demand a supply of water for domestic purposes, furnish to such owner or occupier or other person a sufficient supply of water for their domestic purposes, at the rates hereinafter specified.*

New River (15 & 16 Vict., cap. 160, sec. 35).—That the company shall, at the request of the owner or occupier of any house or part of a house in any street within the limits in which any pipe of the company shall be laid, or of any person who, under the provisions of this Act or any Act incorporated therewith, shall be entitled to demand a supply of water for domestic purposes, furnish to such owner or occupier or other person, a sufficient supply of water for domestic purposes at the rates hereinafter specified.*

Southwark and Vauxhall (15 & 16 Vict., cap. 158, sec. 53).—That the company shall, at the request of the owner or occupier of any house or part of a house occupied as a separate tenement in any street within their limits in which any main or service pipe of the company shall be laid, or of any other person who, under this Act, shall be entitled to demand a supply of water for domestic purposes, furnish to such person, by means of communication pipes and other necessary and proper apparatus, to be provided, laid down, and maintained at the cost of such person, a sufficient supply of water for his domestic purposes, at a rate per centum per annum on the annual value of the house not exceeding five pounds.*

West Middlesex (15 & 16 Vict., cap. 159, sec. 39).—That the company shall, at the request of the owner or occupier of any house in any street within the limits of this Act in which any pipe of the company shall be laid, or of any person who, under the provisions of this Act or any Act incorporated therewith, shall be entitled to demand a supply of water for domestic purposes, furnish to such owner or occupier or other person a sufficient supply of water for their domestic purposes at the rates hereinafter specified.*

Grand Junction (15 & 16 Vict., cap. 157, sec. 46).—That the company shall, at the request of the owner or occupier of any house in any street within the limits of this Act in which any pipe of the company shall be laid, or of any person who, under the provisions of this Act or any Act incorporated therewith, shall be entitled to demand a supply of water for domestic purposes, furnish to such owner or occupier or other person a sufficient supply of water for their domestic purposes at the rates hereinafter specified.*

East London (16 & 17 Vict., cap. 166, sec. 74).—That the company shall, at the request of the owner or occupier of any house, or any part of a house occupied as a separate tenement, in any street within their limits in which any main or service pipe of the company is or shall be laid, or of any person who, under this Act shall be entitled to demand a supply of water for domestic purposes, furnish to such person by means of communication pipes and other necessary and proper apparatus to be provided, laid down, and maintained at the cost of such person, a sufficient supply of water for his domestic purposes, at a rate per centum per annum on the annual value of the house not exceeding ..... .*

Kent (27 & 28 Vict., cap. 146, sec. 28).—The company shall, at the request of the owner or occupier of any house or part of a house in any street in which from time to time any pipe of the company is laid, or of any person who, under the provisions of this Act is entitled to demand a supply of water for domestic purposes, furnish to him a sufficient supply of water for domestic purposes at rates not exceeding the following .....*

* In every case the maximum legal water-rate which may be charged is named in the Act.

It is, however, provided that the companies shall not be bound to supply water under pressure at any higher level than the levels fixed by the Acts of Parliament of the respective companies.

The maximum height to which each of the metropolitan water companies is bound to supply water, and the Act of Parliament under which each provision is made is given below.

Chelsea (15 & 16 Vict., cap. 156, sec. 54).—To a height which is ensured by a pressure in a reservoir, the level of which shall not be less than 148 feet above Trinity high-water mark.

East London (Sch. B of the Metropolis Water Act, 1871, and sec. 15 of the Metropolis Water Act, 1852).—40 feet above level of pavement nearest the point at which supply shall be required.

Grand Junction (15 & 16 Vict., cap. 157, sec. 41).—150 feet above the level of high-water mark at Vauxhall Bridge, computed according to the Trinity standard.

Kent (Sch. B of the Metropolis Water Act, 1871, and sec. 15 of the Metropolis Water Act, 1852).—180 feet above Trinity high-water mark.

Lambeth (11 Vict., cap. 7, sec. 35).—To 150 feet above Trinity high-water mark of river Thames.

New River (15 & 16 Vict., cap. 160, sec. 28).—70 feet in height from the pavement of the street in which the house supplied is situate.

Southwark and Vauxhall (15 & 16 Vict., cap. 158, sec. 48).—150 feet above the level of high-water mark at Vauxhall Bridge, computed according to the Trinity standard.

West Middlesex (15 & 16 Vict., cap. 159, sec. 34).—200 feet above the level of Trinity high-water mark at Hammersmith Bridge, computed according to the Trinity standard.

The companies are not bound to furnish a supply of water or to lay down any pipe for that purpose in any part of a district which is for the time being supplied with water by any other company, but this exemption does not apply in the cases of the Kent and Lambeth companies.

The statutory provisions with regard to the supply of water are contained in the Waterworks Clauses Act (1847) and are as follows (sections 43 and 53):—

If, except when prevented as aforesaid, the undertakers neglect or refuse to fix, maintain, or repair such fireplug, or to furnish to the Town Commissioners a sufficient supply of water for the public purposes aforesaid, upon such terms as shall have been agreed on or settled as aforesaid, or if, except as aforesaid, they neglect to keep their pipes charged under such pressure as aforesaid, or neglect or refuse to furnish to any owner or occupier entitled under this or the special Act to receive a supply of water during any part of the time for which the rates for such supply have been paid or tendered, they shall be liable to a penalty of ten pounds and shall also forfeit to the Town Commissioners, and to every person having paid or tendered the rate, the sum of forty shillings for every day during which such refusal or neglect shall continue after notice in writing shall have been given to the undertakers of the want of supply.

Every owner and occupier of any dwelling-house or part of a dwelling-house within the limits of the special Act shall, when he has laid such communication pipes as aforesaid, and paid or tendered the water-rate payable in respect thereof, according to the provisions of this and the special Act, be entitled to demand and receive from the undertakers a sufficient supply of water for his purposes.

Provisions as to Water-rates.

The rates chargeable by the water companies are fixed by the Acts of Parliament of the companies and are based upon the annual value of the premises, with fixed maximum charges in addition for water-closets, baths, &c. These rates and charges vary in the case of the different companies. Outside the metropolis the rates have been charged upon the annual value of the premises; in cases of difference of opinion as to what is the annual value the matter may be determined by two justices (section 68 of the Waterworks Clauses Act, 1847). This provision is as follows:—

The water-rates, except as hereinafter and in the special Act mentioned, shall be paid by and be recoverable from the person requiring, receiving, or using the supply of water, and shall be payable according to the annual value of the tenement supplied with water, and if any dispute arise as to such value the same shall be determined by two justices.

A dispute which arose as to the interpretation of this section led to the celebrated case of Dobbs *versus* The Grand Junction Water Works Company. (L. R. 9 App. Cas. 49; 53 L. J. Q. B. 50; 49 L. T. (N.S.) 541; 32 W. R. 432; 48 J. P. 5.) It was decided that the value of the premises was to be ascertained on the same principles as those which apply to the ascertainment of the rateable value for the purposes of

[4] Minutes of Proceedings taken before the Royal Commission on London Water Supply, Tuesday, March 14th, 1899. Sixtieth day. Dyson and Co., 9, St. George-street, Westminster, S.W. Pp. 470-473. These are the shorthand notes taken at the sittings of the Llandaff Commission, and supplied to the Commission (gratuitously) and to the water companies and "parties interested" on payment of a proportional part of the expenses. The notes were at the sittings of the Commission commonly referred to as the "County Council Print."

the poor-rate. In the year 1885 the Water Rate Definition Act (48 & 49 Vict., cap. 34, sec. 1) was passed and it was enacted that the words "annual value of the tenement supplied with water" shall mean "rateable value as set from time to time by the local authority as duly constituted."

Owners of property in the districts supplied by the East London, Grand Junction, Kent, Southwark and Vauxhall, and West Middlesex companies are, under the special Acts of those companies, liable to pay the water-rate where the value of the premises does not exceed £20 per annum. In the case of the Chelsea, the New River, and the Lambeth companies owners of property are liable to pay the water-rate where the value of the premises does not exceed £10 per annum. This is provided by the Waterworks Clauses Acts, 1847, section 72 of which is as follows:—

The owners of all dwelling houses or parts of dwelling houses occupied as separate tenements, the annual value of which houses or tenements shall not exceed the sum of ten pounds, shall be liable to the payment of the rates instead of the occupiers thereof; and the powers and provisions herein or in the special Act contained for the recovery of rates from occupiers shall be construed to apply to the owners of such houses and tenements; and the person receiving the rents of any such house or tenement as aforesaid from the occupier thereof, on his own account, or as agent, or receiver for any person interested therein, shall be deemed the owner of such house or tenement.

Water-rates are payable quarterly in advance under a provision of the Waterworks Clauses Act, 1847, of which section 70 is as follows:—

The rates shall be paid in advance by equal quarterly payments, in England or Ireland at Christmas Day, Lady Day, Midsummer Day, and Michaelmas Day, and in Scotland at Martinmas, Candlemas, Whitsuntide, and Lammas, and the first payment shall be made at the time when the pipe by which the water is supplied is made to communicate with the pipes of the undertakers or at the time when the agreement to take water from the undertakers is made.

Payment of water-rates may be enforced by cutting off the supply and recovery of the amount due in a court of summary jurisdiction. This is provided under the Waterworks Clauses Act, 1847, section 74 of which is as follows:—

If any person supplied with water by the undertakers, or liable as herein or in the special Act provided to pay the water-rate, neglect to pay such water-rate at any of the said times of payment thereof, the undertakers may stop the water from flowing into the premises in respect of which such rate is payable by cutting off the pipe to such premises or by such means as the undertakers shall think fit, and may recover the rate due from such person, if less than twenty pounds, with the expenses of cutting off the water and costs of recovering the rate, in the same manner as any damages for the recovery of which no special provision is made are recoverable by this or the special Act; or if the rate so due amount to twenty pounds or upwards the undertakers may recover the same with the exception of cutting off the water by action in any court of competent jurisdiction.

Provisions as to Cutting Off Supplies.

In the cases in which the owner and not the occupier is liable whether by law or by agreement with the water company to pay the water-rate the companies are not allowed to cut off the water-supply for non-payment of water-rate, but they may sue the owner or, failing him, the occupier, and the rate may become a charge on the premises. Section 4 of the Water Companies (Regulation of Powers) Act, contains this provision.

"Every water company which is a trading company supplying water for profit and to which any of the provisions of the Waterworks Clauses Act, 1847, have been or shall be made applicable by any special Act or provisional Order confirmed by Parliament."

Water companies are required to give notice in writing to the sanitary authority within 24 hours of their having cut off the water-supply to any inhabited dwelling-house, subject to the payment of a penalty of £10 The Public Health (London) Act, 1891, section 49 (54 & 55 Vict., cap. 76), provides that—

1. Where a water company may lawfully cut off the water-supply to any inhabited dwelling-house and cease to supply such house with water for non-payment of water-rate or other cause, the company shall in every case, within twenty-four hours after exercising the said right, give notice thereof in writing to the sanitary authority of the district in which the house is situated.
2. Any company which neglects to comply with the foregoing provision shall be liable to a fine not exceeding ten pounds, and it shall be the duty of the sanitary authority to take proceedings against any company in default.
3. This section shall apply to every water company which is a trading company supplying water for profit.

Unless an incoming tenant shall have agreed with the outgoing tenant who is in default in respect of the water-rate, to pay such arrears the companies are not allowed to require payment of arrears of water-rate from the incoming tenant as a condition of supply, but must supply water to the incoming tenant upon being required by him so to do. This is provided for by the Metropolis Water Act, 1871, section 48, which is as follows:—

In case any consumer leave the premises where water was supplied to him without paying to the Company the rate due from him, the Company shall not require from the next tenant of the premises payment of the arrears so left unpaid, unless the incoming tenant agreed with the defaulting consumer to pay the arrears, but the Company shall, notwithstanding any such arrears, supply water to the incoming tenant, on being required by him so to do.

The obligation under which the companies are placed to lay mains and supply water may be enforced in a court of summary jurisdiction by the recovery of penalties, at the suit of the owner or occupier, under the provisions of the Waterworks Clauses Act, 1847, and the Acts of Parliament of the companies, or by the recovery of penalties on the order of the Railway and Canal Commission under the Metropolis Water Act, 1897, at the suit of the consumer or of the local authority; a local authority may also aid a consumer to take proceedings and may pay any legal expenses (if necessary).

Constant Supply for Domestic Use.

The metropolitan water companies are required to provide and keep throughout their water limits a constant supply of pure and wholesome water sufficient for the domestic purposes of the inhabitants within such limits constantly laid on at such pressure as will make the water reach the top storey of the highest houses within such limits (but not exceeding the levels prescribed by the Acts of Parliament of the respective companies) and, subject to the Acts of Parliament of the respective companies as amended by the Metropolis Water Act, 1871, to give to the inhabitants a constant supply of water for domestic purposes. By the Metropolis Water Act, 1871, the companies are, under a penalty of £200 and a further penalty of £100 per month, bound to provide a "constant supply" of pure and wholesome water within the area of the metropolis if required by the metropolitan authority or by the Local Government Board at such times as may be fixed by the Local Government Board who may in certain conditions extend such times, but the companies are not liable to penalties if the want of supply arises from frost, unusual drought, or other unavoidable cause or accident.

The statutory provisions are contained in the Metropolis Water Act, 1871 (34 & 35 Vict., cap. 113), sections 7, 8, 11, 13, 15, 16, 44, and 45). These provisions are as follows:—

Subject to the provisions of this Act, every Company may, and from and after the expiration of eight months from the passing of this Act every Company shall, when required so to do, in the manner directed by this Act, provide and keep throughout their water limits, or throughout such parts of such limits as they may be required in manner aforesaid, a constant supply of pure and wholesome water sufficient for the domestic purposes of the inhabitants within such water limits, constantly laid on at such pressure as will make such water reach the top storey of the highest houses within such water limits (but not exceeding the level prescribed by the special Act) of such Company (which supply is in this Act referred to as a "constant supply"); and every such Company shall, subject to the provisions of the special Act as the same are amended by this Act, give and continue to give to such inhabitants a constant supply for domestic purposes in manner prescribed.

The Metropolitan Authority shall, whenever they are of opinion that there should be in any district a constant supply, make application to the Company within the water limits in which such districts is situate, requiring a constant supply in such district, and any Company may without any such application propose to the Metropolitan Authority to give a constant supply in any district.

It shall be lawful for the Board of Trade at any time to require a constant supply to be provided in any district by the Company within the water limits of which such district is situate upon complaint made, and in case it appears to such Board, after due inquiry:

That the Metropolitan Authority refuses to make or unreasonably delay making application for such constant supply, or

That by reason of the insufficiency of the existing supply of water in such district, or the unwholesomeness of such water in consequence of its being improperly stored, the health of the inhabitants of such district is, or is likely to be, prejudicially affected.

Where a constant supply is required in any district and the Company is unable from want of funds or other cause of any kind to execute all the necessary works within the time prescribed by this Act the Board of Trade, if they think fit, may extend the time for the giving of such supply generally or may extend the time and direct such supply to be given at different times in succession to the several parts of such district in such a manner as may be found most convenient: Provided that application be made by the Company for such extension of time within one month after the notice referred to in the last preceding section has been served upon them.

Notwithstanding anything in this Act a Company shall not be subject to any liability for not giving a constant supply if the want of such supply arises from the frost, unusual drought, or other unavoidable cause or accident.

Any Company which violates, refuses, or neglects to comply with any of the preceding provisions of this Act shall be liable to a penalty not exceeding two hundred pounds and to a further penalty not exceeding one hundred pounds for every month during which such violation or refusal or neglect to comply with the said provisions continues after they shall have received notice in writing from the Board of Trade (Local Government Board) to discontinue such violation, refusal, or neglect as aforesaid.

Every penalty incurred by any Company by reason of non-compliance

with any of the provisions of this Act shall go and belong to the Metropolitan Authority within the jurisdiction of which the same has been incurred, and may be sued for and recovered by such Metropolitan Authority in any court of competent jurisdiction for the recovery of any ordinary simple contract debt of the like amount, and shall be paid and applied as such Metropolitan Authority shall from time to time direct.

Every such penalty shall be borne and paid (to the satisfaction of the auditor appointed as in this Act provided) exclusively by and out of the divisible profits of the Company by whom the penalty is incurred, and by way of reduction of dividend.

Except as is by the next preceding section expressly provided, all penalties under this Act may be sued for and recovered in the "Court of Summary Jurisdiction."

The metropolitan authority is, in the metropolis, the London County Council; in the city, the corporation; in the urban sanitary districts outside the metropolis, the urban sanitary authority; and in rural parishes, the vestries.

Under the Metropolis Water Act, 1897, the statutory area of constant supply is extended so as to include the whole of the authorised area of the companies (Water London). The council of the county or of the county borough are the "Metropolitan Authority" empowered to exercise the control for which provision is made in the Act.

These obligations may be enforced in the usual way (see sections 44 and 45 of the Act of 1871) as to recovery of penalties, and in addition the remedies under the Metropolis Water Act, 1897, may be put in force by any consumer, or local authority, by obtaining through the Railway and Canal Commission the determination of any question of interest to water consumers as to the quantity or quality of water supplied or the charges therefor. (See sections of the Metropolis Water Act, 1897, quoted in the next column.)

Constant Supply for Municipal Purposes.

By the Waterworks Clauses Act, 1847, sections 37 to 43, the companies are under the obligation to fix fire-plugs within certain prescribed distances, and unless prevented as aforesaid to keep in all pipes to which a fire-plug is fixed a sufficient quantity of water for: (1) cleansing sewers and drains; (2) cleansing and watering streets; (3) supplying public pumps, baths, and washhouses; and (4) extinguishing fires.

The supply for public purposes is settled, in case of dispute with the local authority, by two justices or in London by a stipendiary magistrate (section 37). The supply for extinguishing fires is, and always has been, supplied without payment; the London County Council have succeeded to the duties of the late Metropolitan Board of Works and within the metropolis they make regulations as to the form, dimension, &c., of fire-plugs under the Metropolitan Fire Brigade Act, 1865, section 32, and as to the form, dimensions, position, number, &c., of the hydrants, under the Metropolis Water Act, 1871, section 34, which is as follows:—

Section 32 of the Metropolitan Fire Brigade Act, 1865, shall operate, subject and according to the provisions following; (that is to say,)

In that section and in this provision the term "fire-plug" and the term "plug" shall include hydrant and all other apparatus necessary or proper in connexion with the Company's pipes for supply of water in case of fire:

Where a Company give a constant supply in any part of their water limits they may, if they think fit, give notice thereof to the Metropolitan Board of Works:

If the Metropolitan Board of Works do not within two months after receipt of any such notice specify, as regards that part of the Company's water limits, what plugs for supply of water in case of fire, at what places, of what dimensions, and in what form they require the Company to provide, then, at any time after the expiration of that time, the Company may, if they think fit, provide in and for that part of their water limits such plugs for supply of water in case of fire, at such places, of such dimensions, and in such form as to the Company seem necessary or proper:

Thereupon, as regards that part of the Company's water limits, the Company shall be deemed to have fully discharged all obligations imposed on them by the said section 32:

All plugs provided by a Company in pursance of this provision may, for the purposes of the fire brigade, be used as if they had been provided on the requisition of the Metropolitan Board of Works under the said section 32.

The providing of plugs by a Company under this provision shall be at the expense of the Metropolitan Board of Works, and the costs, charges, and expenses of the Company in or about the providing of the same shall be paid to the Company by the Metropolitan Board of Works, on demand, out of their general rate, and in default may be sued for and recovered, with costs, by the Company in any court of competent jurisdiction for the recovery of any ordinary simple contract debt of the like amount.

The provisions of the Metropolis Water Act, 1897, apply an additional method of procedure in case of the failure of any statutory duty by the companies, and facilitate the investigation of any cause of complaint whether in regard to the quality or quantity of the water or of the charges imposed. (Section 1, sub-sections (1), (2), and (3).)

The sections of this Act which apply to these matters are given below.

Any water consumer or any local authority may complain to the Railway and Canal Commission that any of the metropolitan water Companies has failed to perform some statutory duty of the Company, and the Commission may hear and determine that complaint and if satisfied of such failure order the Company within the time limited by the order to fulfil the duty, and may, if they think fit, by any such order, impose any penalty for such failure which can be imposed under any Act, and enforce any such order in like manner as any other order of the Commission.

If at any time complaint as to the quantity or quality of the water supplied by any of the metropolitan water companies for domestic use is made to the Railway and Canal Commission by any water consumer or local authority, the Commission may hear and determine such complaint, and if satisfied that the complaint is well founded, may order the Company, within such reasonable time as is specified in the order, to remove the ground of such complaint, and may enforce such order in like manner as any other order of the Commission, and may award damages to the complainant.

All enactments relating to the Railway and Canal Commission (except section 2 of the Railway and Canal Traffic Act, 1894, which restricts the power to award costs) shall, with the necessary modifications, apply to the Railway and Canal Commission for the purpose of their jurisdiction under this Act.

CONTROL NOW EXERCISED IN RESPECT OF QUALITY, QUANTITY, FINANCE, &C.

The Metropolis Water Acts, 1852 and 1871, conferred to the Board of Trade powers of control in respect of the quality and the quantity of water to be supplied and in respect to the financial proceedings of the companies. These powers, under the Public Health Act, 1872, were transferred to the Local Government Board. Under the Metropolitan Water Act, 1897, the Railway and Canal Commission are empowered to make orders to compel the companies to perform any of their statutory duties.

New sources of supply.—**No company is allowed to resort to any new source of supply until it has given three months' previous notice in writing to the Local Government Board, who may appoint an inspector to visit and inspect any sources specially authorised by Parliament, and to see whether the directions contained in the special Act have been complied with. In regard to new sources not specially authorised by an Act of Parliament, the Board's inspector must examine whether they are capable of supplying good and wholesome water for domestic purposes. On his report the Local Government Board are to certify their approval or disapproval of sources not so specially authorised; and if disapproved the company is not allowed to use the new source.**

Quality and Quantity: Regulations concerning Reservoirs and Aqueducts.

Provision is made in sections 2, 3, and 4 of the Metropolis Water Act, 1852, that only covered reservoirs shall be used for the storage of filtered water at any place within five miles of St. Paul's Cathedral; and that covered aqueducts only shall be used for the filtered water and for the filtration of water (other than that derived from wells) used for domestic purposes.

The following are the statutory provisions of control in regard to the filtration, storage, and conveyance of water; they apply to all the metropolitan companies.

Efficient filtration.—**Every company shall effectually filter all water supplied by them within the metropolis for domestic use before the same shall pass into the pipes for distribution, excepting any water which may be pumped from wells into a covered reservoir or aqueduct without exposure to the atmosphere, and which shall not be afterwards mixed with unfiltered water. (15 & 16 Vict., cap. 84, sec. 4.)**

Storage reservoirs.—**Every reservoir within a distance in a straight line from St. Paul's Cathedral, in the City of London, of not more than five miles in which water for the supply for domestic use of the metropolis or any part thereof is stored or kept by any company shall be roofed in or otherwise covered over. (15 & 16 Vict., cap. 84, sec. 2.)**

Pipes and aqueducts.—**No water shall be brought or conducted within the metropolis by any company for the purpose of domestic use otherwise than through pipes or through covered aqueducts, unless the same shall be afterwards filtered before distribution. (15 & 16 Vict., cap. 84, sec. 3.)**

These provisions may be enforced by a penalty of £200 and £100 per month after receipt of notice from the Local Government Board or by order of the Railway and Canal Commission.

Under the provisions of the Metropolis Water Act of 1852, on the receipt of a complaint from 20 householders as to the quality or quantity of water for domestic use, the Local Government Board may appoint a competent person to inquire and report, with powers to inspect and examine

the waterworks. If he reports that the complaint is well founded the Local Government Board are authorised to give notice to the company, which must, within reasonable time, remove the grounds of complaint.

The provisions of the Metropolis Water Act, 1852, which bear on these points, are given below.

If at any time complaint as to the quantity or quality of the water supplied by any Company for domestic use be made to the Board of Trade (Local Government Board) by memorial in writing signed by not less than twenty inhabitant householders paying rents for and supplied with water by the Company, it shall be lawful for the Board of Trade (Local Government Board), at any time within one month after the receipt of such complaint, to appoint a competent person to inquire into and concerning the grounds of such complaint, and to report to the Board of Trade (Local Government Board) thereon.

The person so appointed as aforesaid shall, within three days after such appointment, give notice thereof in writing to the Company, and after such notice as aforesaid, he shall have power to inspect and examine the waterworks of the Company, and to inquire into and concerning the grounds of such complaint; and the Company and their officers shall afford all reasonable facilities for such inspection, examination, and inquiry.

Any person obstructing such inspector in the due prosecution of such inspection, examination, or inquiry, shall forfeit and pay any sum not exceeding ten pounds.

If after receipt of such report it shall appear to the Board of Trade (Local Government Board) that the said complaint is well founded, the Board of Trade (Local Government Board) shall give notice thereof in writing to the Company.

After the receipt of such notice the Company shall, and they are hereby required, within a reasonable time to remove the ground of such complaint.

Any Company which shall violate, refuse, or neglect to comply with any of the provisions hereinbefore contained shall forfeit to Her Majesty the sum of two hundred pounds, and the further sum of one hundred pounds for every month during which they shall continue to violate or to refuse or neglect to comply with the same after they shall have received notice in writing from the Board of Trade to discontinue such violation, refusal, or neglect as aforesaid.

The above powers of the Act of 1852 were extended in the year 1871, and now the Local Government Board may on their own initiative institute an inquiry into the quality of water at any time, with similar powers as if a complaint had been made. The Metropolis Water Act, 1897, extends these powers as to complaint to any consumer or local authority, and any local authority may aid any consumer in its district by prosecuting a defaulting company.

The following provisions of the Metropolis Water Act (1871) refer to these matters:—

The Board of Trade (Local Government Board) may at any time, if and when they think fit, appoint a competent person to inquire into, and report on, the quality of the water furnished by any Company, notwithstanding that no complaint has been made and signed by twenty inhabitant householders, as prescribed by section 9 of "The Metropolis Water Act, 1852," and sections 10, and 11, and 13, and the other provisions of that Act shall apply in every respect as if such person were appointed under section 9 of that Act and as if any matter reported to the Board of Trade (Local Government Board) as requiring alteration on the part of a Company had been the subject of a complaint by such householders as aforesaid.

Water Examiner.

Under section 36 of the Act of 1871 the Board of Trade appointed a Water Examiner—a competent and impartial person with full powers to examine the water, and to see whether it is efficiently filtered, and furnish reports, with information as to the supply, works, &c., of each company. These reports are circulated, and anyone interested can obtain them either directly or through any bookseller from Eyre and Spottiswoode, East Harding-street, Fleet-street, E.C. The reports are issued monthly and the price is 6*d.* per copy.

The provisions under which the Water Examiner is appointed are as follows:—

There shall be a Water Examiner, being a competent and impartial person, from time to time appointed by and removeable by the Board of Trade (Local Government Board), who shall from time to time, in such manner as the Board of Trade (Local Government Board) direct, examine the water supplied by any Company in order to ascertain whether or not the Company have complied with the requirements of section 4 of the Metropolis Water Act, 1852, and shall from time to time report the results of his several examinations to the Board of Trade (Local Government Board); and the Board of Trade (Local Government Board) shall send a copy of every such report to the Company to which the same relates, and the Company may, if they think fit, on each occasion of such examination be represented thereat by some officer, but such officer shall not interfere in the examination.

There shall be paid to such Water Examiner such remuneration by the Companies and in such proportions as such Board appoints.

Constant supply.—It has already been stated that the local authority, the Local Government Board, or any water consumer, can enforce a constant supply (see p. 187).

The method of dealing with a peccant water company has, it should be noted, been greatly simplified by the Metropolis Water Act, 1897. Under the provisions of this Act any aggrieved water consumer can appeal directly to the Railway and Canal Commission.

Prevention of Waste, Misuse, and Contamination of Water.

Such regulations as may be found necessary for the prevention of waste, misuse, undue consumption, or contamination of water, and as to prescribing the necessary fittings, have to be made by any company with the approval of the Local Government Board, and on failure by any company to make or, when required by the metropolitan authority or by 10 consumers, to alter or repeal such regulations, the Board may appoint a competent impartial person of engineering knowledge and experience to make, alter, or repeal such regulations or to advise as to their being sufficient, and on his recommendation the Local Government Board may make, alter, or repeal, and call in special expert assistance, and the metropolitan authority has the right to be heard before any regulations are made, repealed, or altered, and notice thereof has to be given to such authority. The companies are required also to keep and supply maps of their district and pipes.

The statutory provisions for these regulations are contained in the Metropolis Water Act, 1852, section 26, and the Metropolis Water Act, 1871, sections 17, 18, and 19, which are as follows:—

It shall be lawful for any Company from time to time with the approval of the Board of Trade to make such regulations as shall be necessary or expedient for the purpose of preventing the waste or misuse of water and therein amongst other things to prescribe the size, nature, and strength of the pipes, cocks, cisterns, and other apparatus to be used and to interdict any arrangement and the use of any pipes, cocks, cisterns, or other apparatus which may tend to such waste or misuse as aforesaid.

Every Company shall, within six months after the passing of this Act, make regulations for the purpose for which regulations may be made under the authority of section 26 of the Metropolis Water Act, 1852, and the provisions of that section shall apply also to the preventing of undue consumption or contamination of water.

Any Company, if it thinks fit, or if requested so to do by the Board of Trade, may repeal or alter any of the regulations made for the purposes aforesaid, or make new regulations instead of any of the same.

In case any Company does not make regulations within the time specified in this Act, or in case any Company, on being requested in writing by the metropolitan authority, or by any ten consumers of the water supplied by that Company, to repeal or alter any of the regulations for the time being in force, or to make new regulations instead of any of the same, refuses so to do, the Board of Trade may, if they think fit, appoint a competent and impartial person of engineering knowledge and experience to report to them as to such regulations as may be necessary for the execution of this Act, or as to the expediency of altering or repealing such regulations, or of making new regulations, in conformity with such request as aforesaid, and on the report of such person the Board of Trade may make such regulations, repeal, or alterations as they think fit.

Accounts and Audit of the Water Companies' Businesses.

Every company is required to make up and forward to the Local Government Board, to the town clerk of the City of London, and to the clerk to the County Council, and to keep for sale to any applicant, statements of account in the form and containing the particulars prescribed by the Local Government Board, and that Board is required to appoint a competent and impartial auditor (at such remuneration to be paid by the companies as the Board may fix) to investigate the accounts, ascertaining, distinguishing, and certifying share and loan capital, the amount of new capital, and its expenditure, and if *bonâ fide* made for the purpose of the undertaking. If he should find the accounts incorrect in principle or in detail he may require correction before giving his certificate, and the payment of future dividend is to be suspended until the correction be made and the certificate is given. The companies are bound under penalties of £10 for every default to comply strictly with these provisions and to give all facilities, access to books, and to produce vouchers and afford information to the auditor. Any questions between him and the companies may be referred to arbitration. And subject to this provision the companies are required to abide by the direction and determination of the auditor.

The provisions in regard to the accounts and audit are contained in the Metropolis Water Act, 1871, sections 37 to 42, which are as follows:—

Every Company shall, on or before the thirty-first day of July in each year, fill up and forward to the Board of Trade and to the town clerk of the City of London, and to the Metropolitan Board of Works, and to the vestry clerk of each parish within which water is supplied by each Company respectively not within the City of London, a statement of account, made up to the end of their financial year than last passed, in such form and containing such particulars as may from time to time be prescribed by the Board of Trade.

Each Company shall keep copies of such statement at their office for one year after the date thereof and sell the same to any applicant at a price not exceeding one shilling for each such copy.

In case any Company make default in complying with any of the provisions of this section they shall be liable to a penalty not exceeding ten pounds for each day during which such default continues.

There shall be an auditor of the accounts of the Companies, being a competent and impartial person, from time to time appointed by and removeable by the Board of Trade.

There shall be paid to such auditor such remuneration by the Companies and in such proportions as such Board appoints.

The auditor shall, with all practicable speed after the passing of this Act, investigate the accounts of the Companies, and ascertain and certify the amounts of their capitals, distinguishing share from loan capital, and shall ascertain and certify the capital of each Company and shall from time to time, as new capital shall be expended, in like manner ascertain and certify the amount of such new capital that has been *bond fide* expended for the purposes of the undertaking. Notwithstanding anything in this Act, the auditor shall not investigate the accounts of any Company antecedent to the date mentioned in that behalf in relation to such Company in the Schedule C to this Act annexed.

The auditor shall once in every half-year audit the accounts of the Companies.

If he finds the accounts correct he shall certify the same, but if in any instance he finds the accounts of any Company incorrect in principle or in detail, he shall require such Company to correct such accounts in such manner as he thinks right, and no future dividend shall in any case be declared by any Company until their accounts are certified by the auditor; provided that the suspension of a dividend under this section shall not operate until after the expiration of nine months from the date of the audit.

Each Company shall, during as well as subsequent to the close of that half-year to which the accounts relate, give to the auditor, his clerks, and assistants, access to the books and documents of such Company, and shall, when required, furnish to him and them all vouchers and information requisite for the purposes of the audit, and shall afford to him and them all facilities for the proper execution of his and their duty; and any Company making default in complying with any of the provisions of this section shall, for every such default, be liable to a penalty not exceeding ten pounds.

If any Company think themselves aggrieved by any act or determination of the auditor, the matter in difference shall be referred to the determination of an arbitrator agreed on between such Company and the auditor, or, in default of agreement, appointed, on the application of either party, by the Lord Chief Justice of the Court of Common Pleas; and the reference shall be subject and according to the provisions of the Common Law Procedure Act, 1854: and the decision of the arbitrator shall be final and conclusive; and, subject to this provision, such Company shall observe and abide by the directions and determinations of the auditor.

Limitation of the Dividends of the Companies.

By the Waterworks Clauses Act, 1847, the companies (except in the case of the New River Company) can only pay dividends on their ordinary share capital at the rate prescribed by their special Acts and in no case beyond a maximum of 10 per cent. per annum. They are, however, allowed to make up back dividends, and all surplus profits, subject to the formation of a reserve fund of limited amount, must be applied in making a reduction of the rates charged to the consumers for water. The West Middlesex Company having paid all the back dividends due to the shareholders and having formed a reserve fund are required at the present time to make a reduction in the rates they charge. This reduction, which is a statutory necessity, is noted on the water-rate bills sent out by the company and is called a "rebate"—a word possibly liable to the misinterpretation that the customer is enjoying some beneficent liberality on the part of the company.

The provision in regard to the limitations of the dividends, which may be paid by the companies is contained in the Waterworks Clauses Act, 1847, sections 75 to 82, which are as follows:—

And with respect to the amount of profit to be received by the undertakers when the waterworks are carried on for their benefit be it enacted as follows:—

The profits of the undertaking to be divided among the undertakers in any year shall not exceed the prescribed rate, or where no rate is prescribed they shall not exceed the rate of ten pounds in the hundred by the year on the paid up capital in the undertaking, which in such case shall be deemed the prescribed rate, unless a larger dividend be at any time necessary to make up the deficiency of any previous dividend which shall have fallen short of the said yearly rate.

If the clear profits of the undertaking in any year amount to a larger sum than is sufficient after making up the deficiency in the dividends of any previous year as aforesaid to make a dividend at the prescribed rate the excess beyond the sum necessary for such purpose shall from time to time be invested in Government or other securities and the dividends and interest arising from such securities shall also be invested in the same or like securities in order that the same may accumulate at compound interest until the fund so formed amounts to the prescribed sum, or if no sum be prescribed to a sum equal to one-tenth part of the nominal capital of the undertakers, which sum shall form a reserve fund to answer any deficiency which may at any time happen in the amount of divisible profits or to meet any extraordinary claim or demand which may at any time arise against the undertakers, and if such fund be at any time reduced it may thereafter be again restored to the said sum, and so from time to time as often as such reduction shall happen.

Provided always that no sum of money shall be taken from the said fund for the purpose of meeting any extraordinary claim unless it be first certified in England or Ireland by two Justices and in Scotland by the Sheriff that the sum so proposed to be taken is required for the purpose of meeting an extraordinary claim within the meaning of this or the special Act.

When such fund shall, by accumulation or otherwise, amount to the prescribed sum or one-tenth part of the nominal capital, as the case may be, the interest and dividends thereon shall no longer be invested, but shall be applied to any of the general purposes of the undertaking to which the profits thereof are applicable.

If in any year the profits of the undertaking divisible amongst the undertakers shall not amount to the prescribed rate such a sum may be taken from the reserved fund as, with the actual divisible profits of such year, will enable the undertakers to make a dividend of the amount aforesaid and so from time to time as often as the occasion shall require.

In England or Ireland the Court of Quarter Sessions and in Scotland the Sheriff of such county may, on the petition of any two water-rate payers within the limits of the special Act, appoint some accountant or other competent person, not being a proprietor of any waterworks, to examine and ascertain at the expense of the undertakers the actual state and condition of the concerns of the undertakers and make report thereof to the said Court at the then present or some following sessions, or to the Sheriff (the amount of such expense to be determined by the said Court or Sheriff), and the said Court or Sheriff may examine any witnesses upon oath touching the truth of the said accounts, and the matters therein referred to, and if it thereupon appear to the said Court or Sheriff that the profits of the undertakers for the preceding year have exceeded the prescribed rate the undertakers shall, in case the whole of the said reserved fund has been and then remains invested as aforesaid and in case dividends to the amount hereinbefore limited have been paid, make such a rateable reduction in the rates for water to be furnished by them as in the judgment of the said Court or Sheriff shall be proper, but so as such rates when reduced shall insure to the undertakers, regard being had to the amount of profit before received, a profit as near as may be to the prescribed rate.

Provided always that if, in the case of any petition so presented, it appear to the said Court or Sheriff that there was no sufficient ground for presenting the same the said Court or Sheriff may, if they or he think fit, order the petitioner to pay the whole or any part of the costs of or incident to such petition (the amount thereof to be determined by the said Court or Sheriff), and the costs so ordered to be paid shall be recoverable in the same way as damages are recoverable under this or the special Act.

If the undertakers shall, for seven days after being required to produce to the said Court or Sheriff or to the said accountant or other person as aforesaid, any books of account or other books, bills, receipts, vouchers, or papers relating to their pecuniary affairs refuse or neglect to produce such books, bills, receipts, vouchers, or papers, they shall forfeit the sum of one hundred pounds for every such refusal or wilful neglect and the further sum of ten pounds for every day during which such refusal or wilful neglect shall continue after the expiration of the said seven days, such respective penalties to be recovered by any person who will sue for the same, with full costs of suit, in any of the Superior Courts.

Issue of New Capital by the Companies; the Sinking Fund Clause.

The companies are now compelled to issue any new capital authorised by their recent private Acts under the "Auction Clauses," which provide that all new capital shall be offered either by sale or by public auction or by tender at a reserved price, to be sent under seal to the Board of Trade and after 28 days' previous notice, to be given to the Town Clerk of the City of London, the clerk of the London County Council and to the secretary of the London Stock Exchange, and after advertising the same four times during such period in two or more London daily papers (these conditions are supplemented in more recent Acts by provisions that the stock shall be issued at such rate of interest as in the opinion of the Governor of the Bank of England shall be best calculated to secure the issue of the stock at par), and further, that any premium derived from such issue shall not be considered profits of the company, but shall be expended in extending and improving their works and shall not be considered as part of the capital entitled to dividend.

The sinking fund clause has been inserted in special Acts of all the companies.

The first sinking fund clause was introduced at the instance of the City of London into the East London Company's Act of 1886. Since that time three other forms of the clause have been adopted in the case of the other companies, and now the clause has been applied to all the companies. Lord Llandaff's Commission which went carefully into the question reports that the operation of the clause in all cases is substantially this: "Whenever a company obtains power to borrow money on debenture stock the clause assumes that the money so borrowed earns profit at the average percentage of the dividend or interest paid on all capital of the company. The excess of that average percentage over the interest payable on the debenture stock *plus* 1 per cent. for management of such debenture stock is taken as the profit earned by the new money and the company are required to pay the whole of the excess to the Chamberlain of the City of London as trustee for the purpose of purchasing and holding shares of the company and of investing the dividends thereon with the view of ultimately extinguishing the capital of the company or for such other purpose as Parliament may from time to time determine." The effect of the clause is therefore to prevent any additional value accruing to the undertaking from the new loan capital.

III.—RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER CONTROL.

The Balfour Commission 1892–93: The Balfour Report on the Available Supply of Water; Available Sources of the New River Company as given to the Balfour Commission, 1892; Available Sources of the New River Company as given to Sir Joseph Pease's Committee, 1896; The Balfour Commission on the Quality of the Water; The Balfour Commission Advise Control of Filtration; Information with regard to the Wells and to the Effects of Pumping required from companies.—Llandaff Commission: Terms of Reference; Intercommunication Scheme Advised and Passed; Water Board Recommended by the Llandaff Commission; Establishment of a Water Board Impracticable at Present; Purchase of Water Companies Opposed by Surrey; Water Board Undesirable for Kent; Control Recommended by the Balfour and Llandaff Commissions; Financial Control; Sir John Lubbock on "Internal Control" (Financial); The Anomalous Position of the Auditor appointed by the Local Government Board; Quality of the Water Supplied, Position of the Water Examiner; Suggestions as to Control made by the late Major-General Scott.—Conclusion.

THE BALFOUR COMMISSION, 1892–93.

The Royal Commission which was appointed to inquire into the water-supply of the metropolis in the year 1892 consisted of Baron Balfour of Burleigh, Sir George Barclay Bruce, Kt., Civil Engineer; Sir Archibald Geikie, Kt., Doctor of Laws, Professor of Geology and Mineralogy in the University of Edinburgh; Mr. James Dewar, M.A., Jacksonian Professor of Experimental Philosophy, Cambridge; George Henry Hall, Civil Engineer; James Mansergh, Civil Engineer; and Dr. William Ogle. The sittings of the Commission extended over a long period of time. The first meeting took place on May 16th, 1892, and the Commission sat at intervals until June 30th, 1893. The result of their sittings was that a quantity of matter was ultimately published consisting of the report,[5] a large book containing the minutes of evidence, a still larger volume containing the appendices to the minutes of evidence, another volume containing maps, plans, and diagrams, and an index published separately.

The matters which were investigated by the Commissioners and on which they reported may be conveniently divided into three parts. First, as to the quantity of water required for the supply of the metropolis; secondly, as to the quality of the water supplied at the time when the Commission sat; and, thirdly, as to whether any additional control over the companies' undertakings was advisable.

Anyone wishing to obtain an accurate account of the proceedings must read the report of the evidence and the book containing the appendices. The volume of the minutes consists of over 550 closely printed pages; the appendices contain over 690 pages. The report of the evidence and of the matter contained in the appendices are of greater value than the report of the Commissioners. Unfortunately some of the evidence given has been proved since to be inaccurate, and as the report was presumably founded on the evidence the opinion of the Commissioners in as far as it was founded on incorrect statements which they received as facts is valueless. It is, therefore, not necessary to deal at any very great length either with the evidence or with the report, but it will be necessary only to show clearly and briefly why it is that the prolonged labours of the Balfour Commissioners have, it must be feared, been to some extent wasted.

It will be best to take the subjects dealt with by the Commission under the divisions already given.

The Balfour Report on the Available Supply of Water.

As to the quantity of water which is available from the present sources, the evidence given before the Balfour Commission was not complete, because there are many districts within the area of Water London whose sources of supply and future requirements were not fully taken into consideration. This, however, is not a matter of very great moment.

The engineers of the metropolitan water companies gave evidence with regard to their sources of supply. It is not necessary to go into detail in the case of the sources of each company. It is sufficient for our purposes to show that the evidence given in one case has since proved to be wrong.

Available Sources of the New River Company as given to the Balfour Commission.

The case is that of the New River Company and it is necessary to go a little into detail with regard to the evidence given by the engineer of that company at the time of the Balfour Commission and the evidence which he has since given with regard to the amount of water which can be obtained from wells belonging to the company.

At the first sitting of Lord Balfour's Commission which was held on May 16th, 1892, Mr. Joseph Francis, engineer to the New River Company, was examined in regard to the amount of water which the company could supply. The evidence appears on pages 2 to 11 of the volume containing the minutes of evidence. A statement of the quantity of water which the New River Company had available is also given in the Appendix of the Royal Commission on the Metropolitan Water-supply, page 1. The statement in the Appendix is as follows:—

At this time the Company have available a quantity of nearly fifty seven million (57,000,000) gallons derivable from the following sources:—

	Gallons per day.
River Lee	22,500,000
Chadwell spring and wells	34,000,000
Ponds for non-domestic use, nearly	330,000
Daily	56,830,000

The next paragraph states: "This quantity is being continually augmented by further development and extension of the chalk well system." Mr. Francis was examined by Lord Balfour in regard to the details of the available quantity of water, and in answer to questions he said that the amount then used was 33,000,000 gallons daily. Of this 22,500,000 gallons came from the Lee the remaining 10,500,000 from Chadwell spring and wells. During the year 1891 the average amount derived from Chadwell spring was 2,000,000 gallons per day.[6] In answer to Lord Balfour the witness gave the quantities which he said the wells could produce daily should that amount be required. The table given was as follows:—

Broadmead Well ...	...	1,500,000	Turnford Well ...	...	3,250,000
Amwell End Well ...	...	1,500,000	Cheshunt Well ...	...	750,000
Amwell Hill Well ...	...	3,250,000	Hoe Lane Well ...	...	3,300,000
Amwell Marsh Well ...		2,800,000	Highfield Well ...	...	3,000,000
Rye Common Well ...		3,750,000	Campsbourne Well ...		3,300,000
Hoddesdon Well ...	...	2,160,000	Betstile Well	(nearly)	500,000
Broxbourne Well ...	...	4,500,000			

In answer to Lord Balfour Mr. Francis said that they had never taken these quantities simultaneously from the wells. "We have," he added, "never needed to do so. I may say that these figures which I give by no means represent what we can get out of the wells by working the engines a little faster, but they are all worked at very moderate speed. We actually do get these quantities whenever we are working; but

[5] Report of the Royal Commission appointed to inquire into the Water-supply of the Metropolis. London: Eyre and Spottiswoode, 1893.

[6] It may be here noted that tables given to Lord Llandaff's Commission by Lord Robert Cecil on behalf of the Hertfordshire County Council showed that the flow of Chadwell spring has steadily and continuously diminished. During the summer of 1897 the spring entirely failed. The amount of water derived from wells was on the average 8,500,000 gallons less than the amount derived from the spring. Mr. Francis admitted that if the company obtained 34,000,000 gallons a day from the springs and wells that amount would be 23,500,000 more gallons than were obtained at the time the evidence was given. The basis of calculation on which the figure 34,000,000 gallons was arrived at was by taking what each well could produce, and had produced, over a period of weeks together, pumping day and night, taking each well separately, and then adding them together and finding the total amount. It was not the maximum quantity that could be taken from the wells, but a fair average of what could be obtained daily in a fair week's work from all the wells.

if we needed more water we could, by increasing the speed, get a great deal more out." In their report Lord Balfour's Commission accepted the figures given, that is to say, that the Chadwell spring and wells were capable of providing 34,000,000 gallons of water daily.

Available Sources of the New River Company as given to Sir Joseph Pease's Committee, 1896.

In the year 1896 a Committee was appointed by the House of Commons to report on Bills which were promoted by the London water companies. Amongst these Bills was one promoted by the New River Company and another Bill in which that company was interested—the Staines Reservoirs Bill. The Select Committee was composed of the following gentlemen:—Mr. Baldwin, Mr. Bond, Mr. John Brunner, and Mr. James Stuart, who were nominated by the House, and Mr. Brigg, Mr. Lewis Fry, Mr. Lees Knowles, Mr. Muntz, and Sir Joseph W. Pease, who were added by the Committee of Selection of the House. Sir Joseph Pease was appointed chairman.

On June 5th, 1896, Mr. Joseph Francis was examined at some length with regard to the amount of water supplied by the wells of the New River Company.[7] In answer to Mr. Balfour Browne he said that in the evidence which he had given before Lord Balfour's Commission he had stated that 56,830,000 gallons a day could be supplied by the company and that they would be able with new machinery to get a great deal more water. The witness would not admit that he represented to the Commission that 56,830,000 gallons were practically in hand, and he said that the Commission "fully understood" that it was nothing of the kind. Sir Joseph Pease said that although he did not desire to interrupt the examination he wished to remark that it was difficult to know what the Commission did understand except what they had put in their report, and that on page 27 of that report they had said that Chadwell spring and wells could supply 34,000,000 gallons daily, and he further pointed out that the witness in his evidence before them had put down the amount which could be furnished by Chadwell spring and the wells at 24,000,000 gallons daily which was 10,000,000 gallons less than he had estimated in the year 1892. The Chairman asked how it was that the figure had been put down at 34,000,000 gallons in 1892 and 24,000,000 gallons in 1896, and the witness replied, "Because we cannot rely upon the machinery always working. In the first place we must make allowance for unavoidable stoppages, for oiling heated bearings, and various causes. Then beyond that, out of the very great number of engines we have there are always some that have to be set off for repairs, and 10,000,000 gallons is not too much allowance to make for that." But Mr. Francis had told the Balfour Commission that 34,000,000 gallons was a fair daily average of what could be obtained, but that it was not the maximum quantity which they would be able to get should they require more.

This evidence speaks for itself. Comment is not necessary. It is seen from the figures quoted and from the evidence which he gave that according to the engineer of the New River Company the amount of water available for the use of the metropolis was found in the year 1896 to be much less in quantity from that which he stated was available when he gave evidence before the Balfour Commission. Lately before the Llandaff Commission it was asked if the engineer could in any way reconcile the figures which had been given before the Balfour Commission with those which he had subsequently given. The answer was that he had made a mistake.

It is quite evident that the conclusion with regard to the quantity of water available arrived at by Lord Balfour's Commission, based on erroneous data, are worthless and no more need be said on the matter.

Balfour Commission on the Quality of the Water.

With regard to the quality of the water-supply an enormous amount of evidence was given as to the sources of the water used by the metropolitan companies. Broadly speaking, the evidence may be divided into two sections. First, that given by the late Sir George Buchanan and by men who had made independent investigations into the matter; and, secondly, that given by experts employed by the metropolitan water companies.

A very interesting and instructive interview took place between Sir George Buchanan and the Commission at Trafalgar-place, Charing-cross, on Tuesday, May 10th, 1892. Anyone interested in the subject of water-supply, and especially of the importance to be attached to the source of the supply, would do well to read carefully the report of this interview. It is to be found on page 428 of the minutes of evidence of the Balfour Commission.

Sir Archibald Geikie towards the end of the interview asked Sir George Buchanan whether there was any particular line of research which he could suggest or recommend to the Commission in regard to the contamination of the sources of supply. Sir George Buchanan replied by recommending the Commission to go and look for themselves or to send someone else to look for them. "I do not think," he said, "there is anything but what I may call field observation, but go and see that what ought not to get into the water does not get into it."

Now, Lord Balfour's Commission did not adopt the method of "field observation." They did not apparently attach such serious importance as did Sir George Buchanan to the evidence given with regard to the pollution of the Thames and to the pollution of the Lee. They apparently attached more importance to the evidence of the scientific experts who were employed by the metropolitan water companies, and placed great reliance in artificial purification methods.

The Balfour Commission Advise Control of Filtration.

With regard to the control of the water companies the Commission recommended that greater power should be placed in the hands of the Water Examiner and that regulations should be made with regard to the filtration of water.

They attached the greatest importance to the efficient filtration of river water and they made important suggestions as to the control of filtration and to the method by which this control should be exercised. These recommendations are embodied in sections 176 and 177 of their report and are as follows:—

> We have further to consider what steps should be taken to ensure the proper treatment of the water that is taken from these rivers for the supply of London. For the water that flows down to the intakes must be subjected to certain important processes before it is brought into a suitable condition for delivery and consumption. These processes consist of subsidence and filtration, and the quality of the water when delivered depends largely upon the thoroughness with which they are carried out. It does not come within the terms of our reference to lay down what should be the exact regulations as regards filtration, that is to say, what should be the proportionate area of the filtering beds, the depth of sand, the frequency of renewal, or the rate at which the water should be allowed to percolate; nor, as regards the subsidence tanks how many days' storage should be deemed sufficient so as to obviate the necessity of taking in turbid storm water and to allow of due settlement; but we cannot shut our eyes to the fact that the provision for these purposes differs enormously in the different companies and in some of them is to our mind quite inadequate.
>
> Regulations on these matters should be drawn up after competent inquiry and adherence to these regulations should be strictly enforced. This enforcement should be entrusted to the public water examiner, who should have the legal right of entry into all the waterworks and the duty of reporting periodically as to the due observance of the conditions laid down. At present the examiner is only admitted to the works on sufferance and, though he has distinctly informed us that he has always been admitted not only without hesitation but with all courtesy by the various companies, it is plain that the standing ground of a man who is inspecting by right is very different from that of one who is only present by courtesy.

Information with regard to the Wells and to the Effects of Pumping required.

Another recommendation given in the Balfour report relates to the obligations which the Commission advised should be imposed on the companies to give accurate information in regard to the amount of water pumped from their wells and in regard to the height of the water in the wells. As we have already seen the information given by the engineer of the New River Company to the Balfour Commission in May, 1892, did not accord with that given by the same witness to Sir Joseph Pease's Committee in June, 1896. Now the Balfour Commission not only felt, but they also expressed, the difficulty they were labouring under in getting "accurate and reliable information," and for that very reason, amongst others, they made the following important recommendation:—

> We think it of very great importance that distinct obligations should be laid upon any company or local authority which is allowed to pump water from the chalk for purposes of public supply to keep accurate observation of the effect of their operations on the level of the water in the wells from which they pump, and return the results to the water examiner under such regulations as may be framed. The great difficulty which we have had to encounter has been in getting accurate and reliable information as to the actual effect of the operations now carried on. The importance of procuring this will increase each year as the limit of what can be taken from any district with safety is gradually being reached

[7] Report on London Water Companies' Bills, ordered by the House of Commons to be printed July 7th, 1896, p. 131, et seq.

The Balfour Commission looked forward to an improvement in the water-supply and suggested two things which appeared to have struck them as the most important factors in the consideration of the question. In the first place they recommended that the powers of the Thames Conservancy Board should be extended and that they should have jurisdiction over the tributary streams of the Thames. An Act passed in the year 1896 gave this power to the Thames Conservancy Board and very great improvements have resulted from its use by that firm and judicious authority. The other matter which appears chiefly to have struck the Balfour Commission was the importance of filtration, and they looked forward to the possibility that the Water Examiner, if and when he were placed in a position firmly to exercise his authority would be able by supervising the methods of filtration to ensure a great improvement in the quality of the water supplied by the companies.

THE LLANDAFF COMMISSION.

A Royal Commission to inquire into the water-supply within the limits of the metropolitan water companies was appointed on May 1st, 1897. The Commissioners were Viscount Llandaff, the Right Hon. John William Mellor, Sir John Dorington, Sir George Barclay Bruce, Mr. Alfred de Bock Porter, the late Major-General Alexander de Courcy Scott (the Water Examiner appointed by the Local Government Board), the late Mr. Henry William Cripps, Q.C., and Mr. Robert Lewis.

Terms of Reference.

The terms of reference were as follows:—

1. Whether having regard to financial considerations and to present and prospective requirements as regards water-supply in the districts within the limits of supply of the metropolitan water companies it is desirable in the interests of the ratepayers and water consumers in those districts that the undertakings of the water companies should be acquired and managed either—(a) by one authority; or (b) by several authorities; and if so, what should be such authority or authorities. To what extent physical severance of the works and other property and sources of supply of the several companies, and the division thereof between different local authorities within the limits of supply, are practicable and desirable; and what are the legal powers necessary to give effect to any such arrangements.
2. If the undertakings are not so acquired, whether additional powers of control should be exercised by local or other authorities; and if so, what those powers should be.
3. Whether it is practicable to connect any two or more of the different systems of supply now administered by the eight metropolitan companies; and if so, by whom and in what proportion should the cost of connecting them be borne and what are the legal powers necessary to give effect to any such arrangement.

Intercommunication Scheme Advised. Act Passed.

During the sittings of the Commission it was decided to take all the necessary evidence on the third term of reference in view of a possible water famine in the East-end of London. The Commission issued a report advising that steps should at once be taken to allow intercommunication between the companies' mains, a Government Bill was brought in to carry out the recommendation, the Bill became an Act of Parliament, and measures were taken by the water companies to give a supply of water to the East London Waterworks Company.[§] The promptitude with which the measure passed was creditable, and the ready way in which both Houses of Parliament, in case of a pressing emergency, passed a measure which was undoubtedly for the public interest will, we trust, encourage the Government to deal without delay with the pressing needs of the people of London in regard to the water-supply. It is in that hope that we now proceed to deal with some of the recommendations given in the Llandaff report. The columns of THE LANCET have contained *résumés* of the evidence given before the Llandaff Commission. We cannot reproduce the reports of the evidence or the digests of the Llandaff report which have appeared in our columns. We can only give in the most brief outline the gist of that report, and point out why the Government cannot be expected to frame a measure to carry out all the recommendations it contains, and why, on the other hand, the Government would not be justified in simply allowing things to remain as they are, or, to be more precise, why they cannot be permitted to allow things to drift any longer.

Water Board Recommended by the Llandaff Commission.

The gist of the Llandaff report is to the effect that a Water Board should be appointed to buy the present water undertakings and to carry on the business of supplying London with water. It is also recommended that additional measures of control should be put into force and that this should be done in case either of the formation of a Water Board or in case the water undertakings are carried on by the companies.

It is necessary to say a few words about the Water Board proposed by the Llandaff Commission. The Board proposed would be a body elected by the London County Council, the Corporation of London, and the County Councils and Town Councils of the counties and towns which are situated in Water London—that is to say, the area at present supplied by the metropolitan water companies. The county of London would have no preponderating vote (or "voice"), although the rateable value and population of London would be greater than the rateable value and population of the extra-metropolitan districts. It is doubtful if the composition of the Water Board as proposed by the Llandaff Commission would satisfy anyone. Mr. Whitmore, Member of Parliament for Chelsea and a member of the London County Council, in the evidence which he gave before the Llandaff Commission said that no solution of the metropolitan water question would satisfy the "sentiment" of the London County Councillors if it did not give them a preponderating "voice." In an article which he lately wrote, however, Mr. Whitmore presses the Government to undertake immediate legislation with a view to carry out the recommendations of the Llandaff Commission. Now, as Mr. Whitmore is a "practical politician" it is necessary from our point of view to show why it is that the Government could not, without the most violent opposition, pass such a measure as that recommended by Mr. Whitmore in his more recent utterances.

Establishment of a Water Board Impracticable at Present.

"Water London," in the whole of which the proposed Board would reign supreme in all questions of water-supply, occupies an area of 620 square miles. The administrative county of London has an area of 121 square miles. But the districts outside London have interests which are not of less importance to them than the districts within London are to Londoners themselves. This proposition will be readily admitted, and it may appear at first sight hardly necessary to state it, but when the minutes of evidence of the Llandaff Commission are published it will be seen what an enormous amount of space is taken up by the evidence of the witnesses employed by the London County Council and by the London water companies, and what a small space is occupied by the evidence given by the representatives of the extra-metropolitan authorities. Now the weight of the evidence must not be judged by the weight of the paper necessary to report it. To take an example, the case presented by the county of Surrey may well serve.

Purchase of Water Companies opposed by Surrey.

The county of Surrey was represented by one gentleman, who appeared alone, without counsel, and gave his evidence very briefly. When the manner and method in which this evidence was given on behalf of Surrey is compared with the evidence given by the London County Council, represented occasionally by two learned counsel in addition to two or more officials whom doubtless the ratepayers pay, the contrast is rather striking, but the evidence of one country gentleman who devotes his time to the interest of his county and submits himself to a cross-examination by hostile counsel without any other protection than a sense of the justice of his cause deserves to be considered of no less value because the case is stated simply without words of supererogation, and therefore evidence of this kind is of no less importance than is that of scientific experts. The evidence of Mr. Halsey, the chairman of the Surrey County Council, was given at the twenty-seventh sitting of the Commission and is reported in the County Council Print, pages 1689–1712. It

[§] The only exception which could be taken to the measure had regard to the manner in which money was to be raised for carrying out the engineering work necessarily involved. The measure was necessary because had it not been passed it seemed probable that the East London Waterworks Company would be unable to supply its customers, and this being so it was not evident why the ordinary sinking fund clause should not have been introduced into the measure on its introduction into the House of Commons. A Committee of the House of Lords recommended that this clause should be introduced and the Bill was returned to the Commons containing it. The Commons, however, rejected the clause and the Bill afterwards became an Act without it. This is not the first occasion on which the House of Lords has interfered with a Bill from the Commons in a manner favourable to the London water consumers. In a Bill which was introduced in the year 1819 for limiting the charges of the metropolitan water companies a Committee of the House of Lords presided over by Lord Donoughmore advised that the water rents should be reduced to a lower level than that recommended by the Commons. The result was that as it was pretended that an alteration in the money clause by the Lords affected the privileges of the Commons the Bill was dropped.

is not necessary here to go into the details of the evidence, it will be sufficient to say that the Surrey County Council wished that the present arrangements for a water-supply to be given by the existing companies should not be interfered with. The evidence was concluded by a short sentence which was produced by the hostile examination by the Parliamentary agent to the London County Council. The final answer of Mr. Halsey, which apparently deterred the agent from following up the matter further and which, indeed, appeared to clinch it finally, was to the effect that purchase by any authority was undesirable and that purchase by the London County Council of the water companies' undertakings, as far as Surrey was concerned, was the worst possible basis of settlement which could be arrived at.

Water Board Undesirable for Kent.

The case of the county of Kent seems to merit quite a separate and special consideration. The history of its water-supply differs very much from that of any other district which came within the scope of the inquiry. The area supplied by the Kent Waterworks Company is a very large one, no less than 179 square miles. The business of the Kent Company has greatly extended as years have passed and the districts beyond those already supplied by the company have in several instances requested them to extend their area so as to include them also. There has been practically no conflict between the local authorities and the Kent Company.

Evidence with regard to the water-bearing strata of Kent was given before the Commission and there seems to be no doubt that there is enough water in the area to supply the county for many years to come. The question arose as to whether it was advisable for the Kent Company to join the other water companies in the scheme of intercommunication. The engineer to the company did not strongly urge that they would be benefited by it, and was evidently convinced that as far as their own area was concerned they could do perfectly well without any intercommunication with the mains of the other metropolitan water companies, for during the drought of the year 1898, when one of their wells failed and there was a breakdown of the machinery at another station, the company still had a sufficiency of water for their own wants. It was, therefore, impossible for the Kent Company to make out a strong case in favour of the hypothesis that the area which they supplied was likely to derive any benefit from any intercommunication with the mains of other companies.

A good deal of evidence was given before the Commission with regard to the amount of the percolation of rain-water which takes place in the chalk, but a scientific witness who was examined on the subject admitted that the amount of water which actually percolates is really a matter rather of speculation than of actual knowledge.

However, the evidence given by all the witnesses pointed to the conclusion that the area supplied by the Kent Company has within its own limits a perfectly adequate supply for the requirements of that district and for the supply of that part of the metropolis which is included in the statutory area of the company. It would be extremely disadvantageous to the people of Kent if their water were pumped away in quantity to supply London with water which the Kentish people require for themselves. The amount which is pumped at present is about half that which it is assumed could possibly be obtained. It is perhaps hardly necessary to point out that it is much easier to get the first half of the water than the second half.

A study of the situation of the wells of the company also shows that many of them are quite close to the boundary of the district—that is to say, the company has gone as far afield as they are authorised—for example, the new well at West Wickham is right on the border of the company's area; that at Shortlands is also close to it; the new well at South Fleet is not far from the western boundary of the company's district; and the well near the Pilgrim's Way south of the North Downs is, as a matter of fact, in the county of Surrey. There is no doubt, therefore, that the Kent Company's wells are so arranged as to take as much water as possible at places near their boundaries. What, it may be asked, does this mean? What importance has it? What has it to do with the question as to whether purchase by a Water Board or by some other body is expedient? And what has it to do with the question as to whether the water companies' undertakings should belong to one or to separate authorities?

Briefly this. Kent has a sufficient amount of water for her own needs. The population is at the present time in many parts, however, sparse, but it is likely to increase. On the other hand, the amount of underground water will not increase. If the water-bearing area were to be under the control of any authority other than the County Council of Kent the interests of the people of Kent would undoubtedly be sacrificed to the wants of London. With regard to the question of a supply of water from Kent passing to a district outside their authorised area, one fact which was mentioned in evidence to the Llandaff Commission is not unworthy of note. The Kent Company supplied to the East London Waterworks Company during the year 1898 a certain amount of their water. It is not explained by what authority this was done. Now, although no one can possibly grudge the people of East London the small amount that the Kent Company was able to send during a period of famine, speaking from the point of view of the people of Kent it does seem that they have the right to know on what authority the Kent Company supplied water beyond their statutory area. In this particular case no harm was done to the people of Kent, but proceedings of that sort are liable to abuse, and if the water interests of Kent are not looked after by Kentish people the county will doubtless suffer in the future no less than Hertfordshire has suffered in the past, suffers now, and is likely to suffer in the future.

The people of Kent have been somewhat fortunate in having the matter of their water-supply managed by local men. Most, if not all, of the directors of the company are residents in Kent, and it is a good general sign of the satisfaction of the Kentish people as to the way in which their interests have been looked after that they should in more than one case elect as Member of Parliament one of the directors of their own water company.

In the course of the inquiry which was carried on before Lord Llandaff it was suggested that it might be advisable that the area now supplied by the Kent Company should be left intact. This would doubtless be the best solution for the people of Kent.

The question as to the rights in underground water was prominently brought before Lord Llandaff's Commission by Lord Robert Cecil on behalf of the county council of Hertfordshire.

We cannot, however, dwell on this question. It is quite certain that the people of Kent are not entirely forgetful of their own interests. Lord Llandaff's Commission showed that both the rural and the urban districts of Kent were aware of the danger which they would run should any authority other than a Kentish one have any power to abstract water from Kent and send it in quantity beyond their boundaries. A Parliamentary proposal to form a Water Board on the lines sketched by the Llandaff Commission would meet with the strongest opposition from Kent. Nor would any one of the metropolitan counties be content with such a measure. Enough we hope has been said to show that the Government would be extremely ill advised to bring in a Bill which would meet with general and merited opposition in the metropolitan counties.

Control Recommended by the Balfour and Llandaff Commissions.

Members of the present Government are responsible for the appointment of the last two Royal Commissions which were constituted to consider the question of the London water-supply. Both the Balfour and the Llandaff Commissions have recommended additional measures of control. And there are measures of control which should be supported by both political parties. They demand immediate attention. The things of greatest urgency may be best considered under the headings of (1) financial control; and (2) general control.

1.—Financial Control.

At the present time the financial control of the companies is in many respects satisfactory. In the first place the water rents charged are not generally excessive and they have been fixed by Acts of Parliament. The dividends which can be paid by the companies (except in the case of the New River Company) are limited by Acts of Parliament. New capital raised by the companies is allowed to be obtained only when provisions for a sinking fund are made.

Sir John Lubbock on Internal Control (Financial).

Sir John Lubbock, now a peer, in the evidence which he gave

before the Llandaff Commission brought forward, we think for the first time, some valuable suggestions as to the additional financial control which he considered fair to the companies and a matter of simple justice to the water consumers. Sir John Lubbock said that in his opinion control may be looked at from two points of view. There was external control, of which an example was that of the power now invested in the London County Council and in the Railway Commissioners by the Act which was passed in the year 1897. This Act, which has reference chiefly to the continuous system of supply, ought, he thought, to have a fair trial. To the other method of control Sir John Lubbock said he attached considerable importance. In his opinion control ought to be exercised over the financial arrangements of the companies. Some of them which are now paying a maximum dividend cannot pay any more to their shareholders however much more they may earn, and it has been alleged that there is *primâ facie* evidence that some of them are inclined to increase their expenditure, perhaps unnecessarily. Sir John Lubbock thought that it was important in any concern that those who were financially interested should have a voice in the management of the business in regard to such questions as to what salaries should be paid, as to the number of the *employés* engaged, and as to the amount of work which should be done by them. These matters could only be managed by what might be called "inside control"—they could not be determined by any exterior controlling body. As an example of such internal control Sir John Lubbock referred to the case of Indian railways in which the Government has a large interest. In the case of these railways, he said, the Indian Government appointed one or more directors to look after their interests in the management of the railway. He thought that the case of the metropolitan water companies was somewhat analogous.[5] The people who paid water-rates in London were practically in the position of ordinary shareholders; for example, in the case of the customers of the West Middlesex Company those people who hold the ordinary shares are practically at the present time preference shareholders. They are entitled to a fixed dividend which they are receiving and they are not entitled to anything beyond this. The persons who really stand in the position of ordinary shareholders are the water-rent payers because they are actually the people who benefit by improved management and by increased profits. For at the present time now that the full dividend is being paid to the shareholders anything which remains over must necessarily be applied to reducing the price charged for water. It is therefore only reasonable that the water-rent payer should be allowed, either through local bodies or in some other way, to appoint representatives to the board of the company to see that their interests are properly looked after. Sir John Lubbock, in giving his evidence, said that he did not wish to suggest that the interests of the water-rent payers were not at the present time thoroughly looked after, but he strongly held that as a general rule and as a matter of principle those people who have a substantial financial interest in the success of a company ought to have a voice in the management of the concern, and it was from that point of view and because the water-rent payers had a direct interest in some of the water companies' earning powers and a contingent interest in others that it was only fair and right that they should have one or more directors on the board of managers. He thought, moreover, that the system would work well. There would be no conflict of interest between the company and the water-rent payers in these matters. Sir John Lubbock said he had not thoroughly considered the questions as to how and by whom the new directors should be elected. In the case of Kent, however, he thought it would be best that the nomination of them should be made by the Kent County Council or by the urban authorities, because if this were done they would get men who really understood the matter. He did not think that it would be well for the London County Council to elect the members because, as everyone knew, the election of members to that body depended on considerations which had no reference to the management of water undertakings. On the other hand, if members were appointed by a local authority those who had had previous experience of such undertakings would doubtless be elected.

With regard to the way in which the new directors would work with the old ones Sir John Lubbock said that his experience of boards was that they were very reasonable and that it very seldom happened that there was any division on the board. The advice of those most competent to judge was usually taken and there was no reason if his proposition were carried out why there should be any conflict of interest. His impression was therefore that things would work smoothly.

The Anomalous Position of the Auditor appointed by the Local Government Board.

There is another matter with regard to control which appears to be most unsatisfactory. The auditor of the accounts of the metropolitan water companies who is appointed by the Local Government Board is paid by the water companies and no provision is made for the payment for any legal advice which he may require in dealing with the accounts of the companies. Mr. Alan Stoneham, the gentleman appointed by the Local Government Board, gave a full account of his duties and of the way in which he carried them out at the thirtieth sitting of the Llandaff Commission. By the provisions of the Act of 1871, under which he was appointed, it was enacted that the auditor was limited with regard to the number of back years for which he was allowed to examine the capital accounts of the companies; that is to say, he could only examine the accounts back to a certain date in the case of each company. The dates in different cases varied from the years 1864 to 1869. Mr. Stoneham audited the accounts which were available in each case and ascertained the method in which they were kept. He had first to satisfy himself that the accounts were kept on a proper system. He had perforce to assume that the existing capital as stated in the accounts of each company was the correct amount of capital. But from the date at which he began his duties he was empowered to allow such sums only to be placed to capital account as in his opinion might properly be so placed. Lord Llandaff asked the witness what would happen when fresh capital was raised if the auditor suggested that some of the amount which the company proposed to spend could not properly be considered capital expenditure. Mr. Stoneham replied that he would not allow any sums which ought not to be credited to capital account to be put there. He looked upon it as a conversion of so much gold in the till into engines or pipes or whatever the money was spent on. Lord Llandaff pointed out that if that were so it was the conversion of a permanent asset into a perishable one and he inquired of Mr. Stoneham as to whether account was taken of the deterioration or depreciation of the plant. Mr. Stoneham said that there was no depreciation account and nothing was "written off" from the capital account for deterioration and depreciation. With regard to the machinery he said that if an engine wore out it was replaced and the charge was put against the revenue of the company, and he accepted the statement of the engineer that the new engine had been put to replace the old one. He did not assure himself with his own eyes that the engine had been replaced by another and proper engine. Mr. Stoneham said that he was not aware that before the water famine which occurred in the year 1894–95 a number of pipes were likely to burst. But the pipes did burst and the accounts of the outlay necessary for reinstatement were taken to him. The matter of how the pipes were to be paid for was discussed by him with the representatives of the companies. It was decided that a certain amount of the expenditure might fairly be charged to capital account and some to revenue. The reason why some part was charged to capital was that the pipes were placed at a greater depth below the surface of the ground than the pipes which they replaced. Mr. Stoneham thought that a certain proportion of the outlay might be reasonably considered to be new work and he had therefore allowed a certain proportion of the expenses incurred to be charged against capital because the pipes had been so lowered.

During his term of office a somewhat curious arbitration case had arisen between the New River Company and himself. It arose in this way. The New River Company had some land at Blackfriars which they sold at a price higher than that which they originally gave for it. The New River Company had contended that the profit should go to revenue and that it should be paid to the shareholders. On the other hand, the auditor contended that the sum so received should be written off the capital. The matter came before the Lord Chancellor who held that the appreciation of the value ought to be considered and treated as revenue. A member of the Commission (Mr. de Bock Porter) asked

[5] In the case of the Indian railways the Government representative has, we believe, much more power of control than Sir John Lubbock suggests should be exercised on the metropolitan water companies.

Mr. Stoneham whether he did not admit that in some cases, in which part of the plant and works of a company had been disused, they became of less value, and Mr. Stoneham replied that he had no official knowledge on that subject. On being further asked who had such a knowledge Mr. Stoneham pointed out that that was a question which did not appear in the accounts of the company, and that he only looked at the accounts which had been made up since the date of his appointment. The Local Government Board had not laid down any instructions for his guidance. If he misconducted himself the Board had the right to remove him, but otherwise they had no right to interfere with the way in which he carried out his duties.

With regard to the question of accounts of money paid in Parliamentary expenses, and as to whether it was debited to the capital account of the company, or whether it was paid out of revenue, Mr. Stoneham explained that before a Bill brought forward by a company became an Act the expenses were paid from the income of the company and in the case of a company opposing Bills all the expenses were paid from the income of the company. He could give no idea as to the amount which the companies had spent in opposing the Bills brought in by the London County Council. He carefully abstained from anything like interference. It may, perhaps, be worth while at this point to remark parenthetically that should a Bill be brought in by the West Middlesex Company and opposed by the London County Council (or *vice versâ*) the whole of the legal and Parliamentary expenses are paid by the London ratepayers and by the water consumers who live in the area supplied by the West Middlesex Company.

With regard to office expenses Mr. Stoneham said that he had the assistance of clerks, but should a dispute arise no provision was made by which he could obtain counsel's opinion, and he had himself borne this expense, paying the money out of his own pocket. In one case which came before Sir Henry James[9] as arbitrator the late Solicitor-General and Mr. Justice Wright were against him. Sir Henry James took the case and argued it so as to give the auditor as much help as possible. He said: "Mr. Stoneham is not represented by counsel and you will understand I will argue it for him." Lord Llandaff inquired whether the auditor meant that Sir Henry James argued to Sir Henry James on account of Mr. Stoneham, and the reply was that he, in fact, did argue the case to himself, appealing to Mr. Stoneham from time to time. Mr. Stoneham said that he found himself at a very great disadvantage in the case (a statement hardly complimentary to Sir Henry James) and therefore in the next case which occurred, when he appeared before Sir Robert Reed, counsel represented him and he paid the fees himself. Lord Llandaff asked whether when the auditor had a difficulty in discharging his duties and the matter had to go to arbitration there was any provision by Parliament that his expenses should be met out of some fund, and the auditor replied that there was no such provision. Lord Llandaff suggested that it was a very serious blot on the Act and the witness concurred that it was a very serious blot. He said that he had never applied to the Board of Trade for legal costs and the water companies had to pay for "taking up the case" (i.e., paying the arbitrator's fees).

It does seem most curious that an auditor appointed under an Act of Parliament by a public department should be in the position in which the auditor of the accounts of the metropolitan water companies showed that he was placed. Such an important officer ought surely to be provided with any legal help which he wants. Is it not a most monstrous state of things that a Parliamentary official acting on behalf of the public should be placed at such a disadvantage? Is it not certain that the interests of water consumers must necessarily suffer? However able and painstaking the auditor may be, is it likely that he has sufficient knowledge of legal technicalities to be able to hold his own against the most clever and skilled counsel who can be employed by the water companies? And to put the matter on higher ground, is it a dignified proceeding that a Parliamentary official should have to contend single-handed against counsel employed by rich trading companies? Surely this state of things should be altered without delay.

The report of the Llandaff Commission recommends that provision should be made for the auditor to have counsel's advice paid for by the Local Government Board. We are strongly of opinion that the auditor himself should also receive a liberal salary and that the money to provide it should not be paid by the trading companies whose financial peculiarities it is his duty to check in the public interest.

[9] Lord James of Hereford.

Quality of the Water Supplied: Position of the Water Examiner.

With respect to the control now exercised as to the quality of the water the Metropolitan Water Act of 1852 (as we have seen, p. 187) provided that no company should resort to any new source of supply without the permission of the Board of Trade.[10] The control with regard to the source of supply appears therefore to be adequate. Certain powers are also exercised under the Acts of 1852 and 1871 with regard to ensuring that water of good quality should be supplied (see p. 188). Under the latter Act the appointment of a Water Examiner by the Local Government Board caused a great improvement in the matter of control, but the provisions made as to the powers and payment of that officer need amendment.

At the present time the Water Examiner has no power of entry on to the premises of any metropolitan water company. This matter was referred to in the report of the Royal Commission presided over by Lord Balfour, and in their report the Commissioners recommended that power of entry to the company's works should be given to the Water Examiner and that he should therefore be able, as a matter of right, to enter any of the premises of the metropolitan water companies instead of visiting them as he now does on sufferance and as a matter of courtesy. Many witnesses who gave evidence to Lord Llandaff's Commission referred to this matter and no representative of any of the water companies made any objection whatever to the proposed alteration. Indeed, one witness who appeared on behalf of the water companies suggested that in his opinion the water analyst or any other person appointed by the Water Examiner for the Local Government Board might well receive the right at any time to make any investigation which he thought fit with regard to the manner in which the water companies carry on their business.

The question as to the remuneration of the Water Examiner is one which cannot be passed over without a few words. At present, as we have seen (see p. 188), under the regulations of the Act of 1871 the Water Examiner appointed by the Local Government Board is paid by the metropolitan water companies. It is not right that the water companies should be called upon to pay an officer of the Local Government Board. It is not suggested that there is really any want of dignity in the reception by the gentleman who holds the appointment of Water Examiner of money which is paid by the water companies. The payment is of course made through the Local Government Board, but it is not seemly that an officer of such importance, whose duties are so responsible, should be paid, either directly or indirectly, by a number of trading companies whose businesses he has to overlook in the public interest. The Water Examiner to the Local Government Board is in all respects a public official and he should be paid from public funds. It is neither right nor dignified for a public department to allow it to be truthfully said that one of their officers is paid out of the profits of private businesses. Now the representatives of the metropolitan water companies do say that they pay the Water Examiner, and it is true that they do. They do so because they are required to do so by a statutory enactment. This may possibly by some people be considered a trivial matter, but we maintain that it is not a trivial matter. The amount of payment which the Water Examiner receives is doubtless totally inadequate payment for the duties which he performs. Such an officer should be highly paid and should have at his command a sufficient and efficient staff. The information which he publishes for the public should be his own information and the information of his own officers. At the present time this is not the case. The monthly report of the Water Examiner contains a number of statements with regard to the quantity of the water-supply and details are given as to the quantity derived from the Thames, from the Lee, and from wells. These figures are supplied by the water companies' servants. The Water Examiner has no power to check them; they are published in an official report and then the figures become official and the "official figures" given by the Water

[10] This power is now vested in the Local Government Board.

Examiner are quoted as such by the representatives of the water companies. Major-General Scott, the late Water Examiner, pointed this out to his fellow members of Lord Llandaff's Commission. There is no secret about it. It is a matter which certainly ought to be altered.

These statistics are not the only things which are supplied by the companies to the Water Examiner. Every month he reports on the quality of the water supplied by the companies. Some of these reports are made by scientific experts who are employed by the companies and they are then published in the official monthly bulletin of the Water Examiner.

With regard to the quantity of water supplied to London, we have already quoted an important recommendation made in the report of Lord Balfour's Commission (see p. 191). We entirely agree with the suggestion that a distinct obligation should be laid upon any company or local authority which pumps water from the chalk for purposes of public supply to keep accurate observation of the effect of these operations on the level of the water in the wells from which they pump and return the results to the Water Examiner under such regulations as may be framed. The great difficulty which the Balfour Commission had to encounter, the report says, had been in getting accurate and reliable information as to the actual effect of the operations now carried on. The importance of procuring this will, as they say, increase each year as the limit of the amount which can be taken from any district with safety is gradually being reached. Now, this suggestion that accurate observations on the water level and the wells of the metropolitan companies should be given to the Water Examiner has not yet become a statutory obligation. The date of the report of Lord Balfour's Commission it may be remembered was 1893, and since that time nothing whatever has been done to carry out this important recommendation. Had it been carried out Lord Llandaff's Commission would have been in a position to see what changes, if any, had taken place in the water level of the wells belonging to the New River and to the Kent companies. At one of their sittings the Llandaff Commission decided that they would not "go behind" the evidence of Lord Balfour's Commission with regard to the quantity of water which could be obtained in the valley of the Thames and of the Lee. Lord Llandaff's Commission, in short, decided not to re-open this question. It is certain that changes have taken place and new conditions have arisen since the date of the Balfour inquiry.

At the Llandaff inquiry Mr. Bowles Bowles, chairman of the New River Company, absolutely declined to give information to Lord Llandaff's Commission with regard to the levels of the wells, and Mr. Francis, chief engineer to the company, objected to give such information because, he urged, the facts would be misleading. Lord Robert Cecil, who appeared before the Llandaff Commission on behalf of the Hertfordshire County Council, and in defence of the rights or alleged rights of the rural water consumers of that county, gave Mr. Bowles Bowles and Mr. Francis every opportunity of affording information, but they evidently had no wish to supply facts which would necessarily have been universally known had the recommendation of Lord Balfour's report been carried into effect by giving it the force of a statutory obligation. Now the study of the tables giving the flow of the New River Company's Chadwell Spring gives support to the general theory propounded by Lord Robert Cecil that the water levels of chalk in Hertfordshire are, and have been for years, gradually sinking.[11] Lord Llandaff pointed out to Lord Robert Cecil that the inquiry on which he was engaged did not embrace consideration of the depletion of the chalk of Hertfordshire. We must, however, suggest, and indeed insist as strongly as possible, that it is of great importance to the people of Hertfordshire, and it is of great importance to the people of Kent, to know accurately the state of the underground water in their respective counties. The measure of control which was recommended in Lord Balfour's report is a measure which Lord Llandaff's Commission have advised Parliament to carry out without further delay. The evidence which has been given by witnesses from the county of Hertfordshire, evidence which will be found in the notes of the report of the Llandaff Commission when they are published, conclusively proves that the people of Hertfordshire have suffered greatly from the depletion of their wells. The facts given have not been contradicted. The same thing may in the future possibly happen in Kent, but if the people of Kent are able to keep for themselves the water which is found "under their feet" they will have less reason to complain. Still in the case of Kent some of the representatives of local authorities have expressed the regret which they now feel that they have allowed the control of the water-supply to pass out of their own hands into that of a commercial company, and if any large amount of water were taken from Kent and sent to the metropolitan area it might well happen that a very inadequate supply would be left to the people of Kent, and it would become a very serious matter for them.

One of the directors of the Kent Company admitted that in any case of inadequacy of supply the fullest information should be given to the public with regard to their wells; but neither he nor the engineer to the company were willing to give to the Llandaff Commission all the information which they possessed as to the height of the water level in the wells. Now if the recommendation of Lord Balfour's report had been made a statutory necessity and a record had been kept of the amount of water pumped daily from each well and a record had been kept of the level of the water in each well daily, and if this information had been regularly published the people of Kent would be in a position to know from week to week or from month to month the state of the underground water in their county. We must insist that it is of the very greatest importance for the people of Kent that this should be done in the future and that a beginning should be made without delay. The County Council of Kent should know as much about the water-supply of their county as possible. From the point of view of the public it is not satisfactory to know that things which were of great moment to the water consumers and which were recommended in the Balfour report have never been carried out.

Suggestions for Control made by the late Major-General Scott.

With regard to the question of control of the metropolitan water companies Major-General Scott made some valuable suggestions in the course of his examination of some of the witnesses who appeared before Lord Llandaff's Commission. The suggestions were conveyed in the form of questions which he addressed to the witnesses. In his examination of Mr. Whitmore Major-General Scott asked the following question: "As regards control should not you consider that the supervising authority should acquaint itself with the state of the works thoroughly and continuously, as it were; that its supervision should be directed to see that every company maintains its works in a proper state of efficiency; and that it should look to the future efficiency from the point of view of starting works in a reasonable time so that there should be no failure from want of capacity in the water-supply? Would not you think that that kind of control would do good? There is no such control at present." Now, as we have seen, the West Middlesex Company pay their full dividend. The shareholders of the company cannot receive more than they do at present. Any money earned in excess of the amount necessary to pay dividends has either to be employed in the working of the business or paid back to the water renters in the form of a reduction in their rates. The West Middlesex Company have had a successful business for a considerable number of years and have not only kept their plant in a state of efficiency but have looked ahead and made provision for the development of future business. This course of conduct has not been adopted by all the metropolitan water companies. In the case, for example, of the Southwark and Vauxhall Company the amount of water abstracted from the Thames was for some time greatly in excess of the amount authorised by Parliament, and sufficient provision was not made for the treatment by sedimentation and filtration of the increased amount of water so taken. The Southwark and Vauxhall Company were not financialy in as flourishing a position as the West Middlesex Company. These are facts it is well to keep in mind because they have a direct bearing on the question asked by Major-General Scott, and which has just been quoted.

Another question which contains a valuable suggestion was the following: "Assuming that a company is in rather bad circumstances and that the directors

[11] The engineer to the New River Company suggested that Chadwell Spring had failed because there was a "crack in the basin." Later in the course of his examination he said that he thought that there was a "crack in the basin" because the spring had failed.

do not like to face the shareholders from time to time with their diminishing dividends, then it is rather an inducement under those circumstances to postpone the construction of works that anyone who looks to the future must see would be absolutely necessary. As these works take as much as five or six years to construct, if they (the directors) postpone the work too long they will find themselves at the end of that time in this condition—that after a dry season (a season of drought or something of that sort) the supply fails and it is absolutely out of the power of anyone to remedy the defect, and then the people complain; but it is too late to complain, no remedy can be applied which would not take months or years to carry out, and therefore the thing is irretrievable. Would it not be a wiser kind of administration which would overlook the company in such a way as to be able to say to a company, 'The time has arrived when you should start certain works or you will find yourselves in a mess.' Would it not be better if such an authority should put for the public a pressure on such a company to oblige them to start the works. Would it not, I say, be a wiser system of administration than to wait until complaints arise of scarcity in a district and an enormous amount of privation occurs, a state in which it is impossible to remedy things?"

Here is another valuable suggestion. "If you look at the Acts of Parliament of 1852, 1871, &c., you will see that the idea of control of some sort or other pervades the whole of them, or a great portion of them. That control really amounts to this, that when anything goes wrong somebody is to be punished, but would it not be better to prevent the wrong originally so that the complaint of wrong-doing should not arise?"

These suggestions deserve the most careful consideration. It may be doubted if they could be carried into effect with the entire approval of those Members of Parliament who are also directors of water companies and who are often listened to in the House as "practical men" with a thorough working knowledge of all matters pertaining to water-supply. But Major-General Scott's questions were asked in the interest of water consumers who were not represented by counsel and the questions were based on a thorough and long experience of all the details of the metropolitan water-supply.

CONCLUSION.

The matters of greatest urgency in respect to control of the London water companies are:—

The auditor appointed by the Local Government Board should be in all respects an officer of that Board and his salary should be paid from public sources. He should, when he wishes it, in the case of any difference with the water companies have the advice and help of the law officers of the Crown.

The Water Examiner appointed by the Local Government Board should have access to all parts of the metropolitan water companies' undertakings. He should be entirely responsible for the report which he issues monthly. The companies should be obliged to place at his disposal every facility for making the several investigations which he wishes. Every investigation which the Water Examiner makes should be done either by himself or by officers appointed by him. Any analyst he may employ should be nominated by himself and all the necessary expenses entailed in carrying out the work necessary for him to give full and accurate information should be paid by the Government department.

No Member of Parliament who represents any part of Water London, whatever may be his political conviction, could fairly object to the measures of control which we have just indicated. The Government having appointed and received the reports of two Royal Commissions have no right to make any further delay, and as both the Balfour and Llandaff Commissions have distinctly reported in favour of increasing the power of the Water Examiner they have no legitimate reason for delay in passing a simple measure which will carry out this recommendation. Any Member of a metropolitan constituency who, either from indifference or because he is a director of a water company or from any other reason, failed to support the Government in passing a measure for the benefit of the whole of the water consumers would richly deserve to lose his seat at the next election. It is now some years ago that the Right Hon. A. J. Balfour said he would not have London water-supply considered as an Imperial question. It is not an Imperial question, but it is of great importance to the people of London and it ought not to be treated as a party question.

THE METROPOLITAN HOSPITAL SUNDAY FUND.

THE following were among the principal amounts received at the Mansion House in aid of this Fund up to July 18th, when the total exceeded £45,000:—

	£	s.	d.
St. Jude's, South Kensington	655	0	0
St. Matthew's, Bayswater	142	0	0
St. Bartholomew's, Sydenham	106	0	0
St. John's, Paddington	165	0	0
St. Paul's, Knightsbridge	268	0	0
Holy Trinity, Tulse-hill	171	0	0
St. Margaret's, Westminster	107	0	0
Portman Chapel, Baker-street	121	0	0
Holy Trinity, with St. Jude, Upper Chelsea	296	0	0
St. Peter's, Kensington-park-road	128	0	0
Parish of St. Peter's, Eaton-square: Parish Church, £542; St. John's, Wilton-road, £67; St. Peter's Chapel, £6; total	615	0	0
St. Peter's, Cranley-gardens	400	0	0
St. Michael's, Paddington	144	0	0
St. Stephen's, Gloucester-road	103	0	0
St. Michael and All Angels', Southfields	25	0	0
Holy Trinity, Islington	24	0	0
Ilford Parish Church and Chapel	33	0	0
St. Barnabas', Pimlico	32	0	0
St. Paul's, Greenwich	20	0	0
All Saints', Clapham-park	36	0	0
St. John the Evangelist, Upper Holloway	24	0	0
St. Mary's Parish Church, Wimbledon	51	0	0
St. John's, Wimbledon, and Missions	54	0	0
Heath-street Baptist Chapel, Hampstead	58	0	0
Essex Unitarian Church, Kensington	95	0	0
Christ Church, Forest Hill	54	0	0
St. Mary Magdalene, Paddington	32	0	0
St. John the Evangelist, Penge	96	0	0
St. George's Presbyterian Church, Brondesbury	20	0	0
Church of Ascension, Balham-hill	51	0	0
St. Mark's Presbyterian Church, Greenwich	33	0	0
St. Paul's, Harringay	28	0	0
Highbury-quadrant Congregational Church	65	0	0
Greek Church, Bayswater	72	0	0
Highbury Presbyterian Church	26	0	0
St. John the Divine, Kennington	51	0	0
St. Luke's, Redcliffe-square	90	0	0
St. Matthew's, Sydenham	26	0	0
Trinity Presbyterian Church, Notting Hill	29	0	0
Catholic Apostolic Church, Maida Hill West	25	0	0
Camden Church, Camberwell	44	0	0
Lyndhurst-road Church, Hampstead	75	0	0
St. Mildred's, Lee	32	0	0
St. Peter's, Streatham	45	0	0
St. Anne's, Soho	56	0	0
St. Andrew's, Wells-street	71	0	0
St. Mary's, Graham-street	27	0	0
St. Matthew's, Upper Clapton	30	0	0
St. Michael and All Angels, Blackheath-park	72	0	0
St. Luke's, Paddington	46	0	0
St. Mary's, Newington	21	0	0
Park Chapel, Crouch End	43	0	0
St. Paul's, Finchley	43	0	0
Christ Church, Ealing	20	0	0
St. Saviour's, Ealing	28	0	0
All Saints', Blackheath	43	0	0
St. Andrew's, South Streatham	22	0	0
Emmanuel, West Hampstead	36	0	0
Rosslyn-hill Unitarian Chapel, Hampstead	82	0	0
Morden Parish Church	22	0	0
St. Stephen's, Wandsworth	61	0	0
Eaton Chapel, Eaton-square	28	0	0
St. John's, Bromley, Kent	39	0	0
Acton Parish Church and Mission	42	0	0
Chipping Barnet Parish Church and Mission	23	0	0
All Saints', Hatcham-park	35	0	0
St. Luke's, Battersea	46	0	0
St. Matthew's, Sinclair-road	20	0	0
St. John's, Red Lion-square	21	0	0
St. Mary Magdalene, Wandsworth	31	0	0
St. James's, West Hampstead	83	0	0
"F."	50	0	0
Hendon Parish Church and Christ Church	42	0	0
German Lutheran Church, Denmark-hill	83	0	0
St. Alphege's, Greenwich	22	0	0
Spanish and Portuguese Synagogue, Bevis Marks	42	0	0
St. Saviour's, Brixton	44	0	0
Hillingdon Parish Church and Evelyn's School Chapel	34	0	0
Christ's Church, Streatham-hill	87	0	0
Magdalene Hospital Chapel, Streatham	28	0	0
Church of the Ascension, Blackheath	26	0	0
Mr. W. Mann Cross, C.C.	20	0	0
St. Augustine's, Honor Oak Park	44	0	0
Holy Trinity, Beckenham	27	0	0
St. Luke's, Deptford	43	0	0
St. Pancras Parish Church	42	0	0
St. Mary's, Spring-grove	33	0	0
Old Malden Parish Church	57	0	0
St. Paul's, Herne-hill	38	0	0
New Court Congregational Chapel	25	0	0

THE LANCET.

LONDON: SATURDAY, JULY 21, 1900.

We have the highest of all authorities for believing that "Wisdom is justified of her children." The truth of the statement must occur to the minds of most of those who read, or were able to hear, the Croonian Lectures which Dr. F. W. MOTT has recently delivered before the Royal College of Physicians of London. They are for the most part the product of the far-seeing wisdom of the London County Council in establishing a laboratory with adequate means for the investigation of the minute pathology of the diseases under treatment at their asylum. It is also an illustration, although not the first, of the wisdom exercised in the selection of a superintendent, whose diligent use of the few years in which he has been at work and his utilisation of the material which has come under his disposal are conspicuously shown in these lectures. We find, indeed, throughout them abundant traces of the work which made Dr. MOTT'S name familiar before his appointment and which furnished the ground on which his appointment was made, but the chief part of their substance consists of the results of researches undertaken by him, or under his direction, at the County Council's Pathological Institute at Claybury; and the extent of this, its value, as well as the manner in which it is presented, must excite the admiration of all those who are capable of estimating its worth.

Originality is the key-note of the presentation which is here given to us of the pathology of nervous disease. All that is presented with this freshness is not indeed new. Many as are the references to the work of others, such a description of the facts, even in the light of original research, must traverse the results previously obtained at more points than it has been possible to indicate. But this does not diminish the interest of the account or its value to all those who are at work on the same subject, and indeed to all those who care to give to the lectures the careful perusal which they require if they are to be perfectly understood. The subject does not lend itself to simple statement. The rapid advance of neurology has brought into almost colloquial use among experts many terms which are still unfamiliar to the majority and the amount of fact with which the lecturer has had to deal has compelled a condensed style which certainly needs close attention to understand. But the requisite attention will be forthcoming from the readers to whom the lectures specially appeal.

The title of Dr. MOTT'S lectures is alike accurate and misleading. The transformation of our conceptions of the nervous system involved in the doctrine of the "neuron" is vaster than is commonly conceived and its wide extent is illustrated in the subjects considered in these lectures. It will be noticed that a final "e" is attached to the word. "Neurone" is the French term, but in all other countries, and generally in this country, the word "neuron" is employed. The addition of the "e" is apparently due to the persistence of Professor SCHÄFER in applying the word "neuron" to the axis-cylinder process, commonly termed the "axon," in opposition to the general use of the word. Dr. MOTT'S modification of the term is harmless, but we doubt whether it will be effective to prevent confusion, or is really required. The vitality of words is often insusceptible of control, even as regards their form. The fittest survives, in contempt of etymology.

Even those who have some acquaintance with neurology might conceive that the title "degeneration of the neurone" would cover a limited region of the minute pathology of the nervous system. The perusal of these lectures will reveal to many for the first time the extent of the change in our conceptions which is involved in the new doctrine. The neuron is now perceived to be the universal unit of the nervous system, the element of its constitution in all parts, so that the "degeneration of the neurone" becomes conterminous with all the processes of degeneration in the nervous system. Not only does the lecturer frankly employ this wide conception, but he includes under the term "degeneration" the changes which are produced by acute processes as well as those which constitute the chronic changes to which the word is often restricted. He is thus able to stretch his net so widely as to gather in it most of the maladies which are not the result of obvious external inflammation. The subject is thus a very large one, and the variety of diseases which it includes is such as to permit, in respect to many, only a glance at those features which have a relation to the special subject.

It is at first somewhat startling to remember that the doctrine of the neuron is one which is still without actual proof. It is essentially founded on the discontinuity of the nerve elements which proceed from each single nerve cell. They were formerly thought to unite at their extremities, their nutrition being still believed to depend on their connexion with the cell. The union of the divided terminations of the branches is now doubted by most histologists. They are believed to be only contiguous, and that the excitation of the adjacent fibrils is effected by a process of stimulation and not continuous conduction. The belief that there is discontinuity rests on the fact that union cannot be traced. But the conditions of observation are such as to leave some investigators still in doubt regarding the validity of the general inference, although the evidence has been accepted so generally that pathologists have no choice but to follow the lead presented to them. The result affords an explanation of so much that was before obscure in pathology as to constitute strong evidence of the truth of the doctrine. This evidence is presented to us by Dr. MOTT with great force and for the most part with effective cogency. But he recognises that, though discontinuity is probable, the union asserted by some does not lessen the general significance of the "neuron" conception of distinct nutritional units. While he regards separation of the elemental parts of the nervous system as probable, he considers that it is not essential to the neuron-conception. He believes that the terminal branches of the processes may be sometimes separate and sometimes continuous. Some hesitation

may be felt in following him here. It is not likely that both systems obtain in the nerve-centres. On either view we can understand that secondary degeneration does not pass into the nutritional domain of another cell. But continuity involves simple conduction; discontinuity implies re-excitation. A new nerve-impulse is excited by the stimulus of that which reaches the adjacent termination of the neuron which conducts the afferent impulse, and the enormous augmentation which occurs in many central processes, as in reflex action, seems more readily thus explained. It is doubtful if we can assume the existence of the double relation or the occurrence of the double process.

As an illustration of the fact that at the present time research is only laying the foundations on which the future superstructure of knowledge must be built may be mentioned the discrepancy in the results obtained by staining the nerve-cells in artificial cerebral anæmia. In the parts of the brain thus deprived of blood considerable alterations are seen in the cells and their processes when these are stained by the Nissl and other methods, but when treated by the chrome-silver method of Golgi both appear perfectly normal, including the gemmæ on the branches. Dr. MOTT draws the inference that only a few of the cells are stained by Golgi's method, and that a large number escape perception altogether in spite of the perfect staining of those which respond to the agents. Considering that it is by this method that the absence of union between branches has been discerned, that it is on the results obtained by this method that the doctrine of separate neuron-units entirely rests, the statement, if true, seems to throw a good deal of reputed fact back into the crucible. We have here an instance of the mental reservation which must be given to many of the conclusions which are put forward as established facts, but which only merit at present provisional acceptance.

The development of the elements of the central nervous system is a subject of which Dr. MOTT has given a full sketch in his introductory lecture. It may at first sight seem anomalous that development forms part of a study of degeneration. But the reason is obvious, and the only objection that can be taken is to the narrowness of the title given to that which has so wide a scope. Development and decay are processes of opposite nature. They underlie the progress and cessation of the vitality of the tissues. The one attends the development of functional capacity, the other its failure. Dr. MOTT has given useful descriptions and illustrations of the remarkable results of the investigations of FLECHSIG, BECHTEREW, and others, which have established the differences in time at which the fibres of the central nervous system acquire their full structural development by the formation of the myelin sheath. The relative time at which this takes place corresponds with the order in which the functions are acquired that the structures subserve. The afferent fibres to the brain develop before those that conduct voluntary impulses, and among the earliest to achieve the myelination necessary for function are those which conduct impulses from the skin, joints, and muscles of the fœtus, whose movements must continually generate afferent impulses through the fibres. The researches of HELD have shown that function exerts a marked influence on this process of myelination. If one eye is kept closed the fibres from it develop perfect structure later than those from the eye which is open, but this is not the case if the animal is kept in the dark. There is, however, a tendency to ordered myelination independent of function. The latter has only a modifying influence, but it can clearly accelerate or retard the process.

It is not practicable to epitomise Dr. MOTT'S condensed sketch of what has been ascertained regarding the histogenesis of the sheath of Schwann, and the conclusions at present reached in regard to the development of other structures are not yet of clear significance. The special subject of the lectures, the degeneration of the neuron and its varied relationships, must be reserved for notice in another article.

SEVERAL of the larger and smaller towns in this country have now come to be known, by their mortality and notification returns, to suffer to an exceptional degree from enteric fever in endemic form. In many of these places it has been found impossible to connect causally the continued prevalence of enteric fever with any of the agencies of infection to which pronounced epidemics of typhoid fever are commonly due. Specific pollution of drinking-water, milk, shellfish, ice-cream, and the like may indeed now and then have caused an increase of the customary amount of enteric fever; perhaps a particular period of sustained fever prevalence has seemed to have been started by an outbreak which was traceable to infected food or drink; but the appearance of enteric fever year after year in excessive amount has quite certainly not been occasioned by recurring exposure to infection through such agencies. Recently much attention has been given to the part which may be played by polluted soil in the transmission of enteric fever infection, and it becomes important to consider soil in this connexion. In individual instances the ability to carry infection of soil, using the word in the narrow sense of surface soil in the neighbourhood of dwellings, is often almost self-evident. Take the case, so common in many of our northern and midland towns, where there are rows of workmen's dwellings or cottages in which the houses open at the back to a common yard, unpaved, badly drained by open gutters, and served by one or more midden privies. Who that has seen the way in which slops are thrown about such yards and the manner in which refuse may be spilled over the surface when carried to, or removed from, the common midden can doubt that a case of enteric fever in a row of houses of this sort occasions risk by way of surface soil pollution to the occupants of the remaining houses—people who, for example, must needs be liable to carry into their dwellings on their hands or boots soil upon which infectious matter has been freshly deposited and to inhale infective dust blown about the common yard? To such and kindred causes, we may well believe, is due the contrast which medical officers of health have on occasion been able to demonstrate between a heavy incidence of enteric fever on particular groups of dwellings where these sanitary deficiencies abound and its much lighter incidence upon neighbouring groups of dwellings of similar class where opportunities of surface pollution are less.

To admit, however, that enteric fever may be locally

spread by way of the diverse and obvious opportunities of infection afforded by recently and specifically polluted surface soil brings us, it is to be feared, little nearer to understanding the causation of endemic enteric fever in the cases to which we alluded above. Ability of soil to act, as it were merely mechanically, as a vehicle of infectious matter which has just been deposited on its surface does not there meet the case. A satisfactory explanation as due to soil pollution of the endemic enteric fever to which we refer seems to require the further proposition that in certain circumstances the typhoid bacillus must be capable of maintaining for weeks and months an active existence in soil—an altogether different and more recondite question. The difficulties of the subject are well illustrated in the case of the city of Chichester, where enteric fever in endemic form has been excessively prevalent for a long series of years since 1870 and has remained prevalent notwithstanding that in the greater part of the city objectionable well waters have been replaced by a safer public supply and cesspools by a modern system of sewers. Dr. THEODORE THOMSON who, with Colonel MARSH, R.E., has lately made a highly instructive report to the Local Government Board on enteric fever at Chichester, a review of which will be found on p. 219, has brought to light many facts, positive as well as negative, which taken as a whole suggest that the explanation must be that there are circumstances of soil which in Chichester, or in certain parts of it, do in some way favour the viability and active growth of the typhoid bacillus in the soil. But what are these favouring circumstances? Dr. THOMSON shows that there exist in Chichester many and diverse potentialities of pollution of soil by organic matter. But, as he also points out, the mere fact that these potentialities exist is no explanation for a special proclivity of the typhoid bacillus for Chichester soil. They are present equally in other towns with no such enteric fever history as Chichester. If this special proclivity does exist—and in our present state of knowledge the assumption seems the one most likely to accord with the facts—it is probably determined by one or other of a large number of obscure conditions which have yet to be studied in this connexion, or by a combination of them. For the subject to be adequately pursued such factors as the physical and chemical characters of the soil, the degree of its moisture, the soil-temperature best adapted to the typhoid organism, and the nature of other organisms in the soil with which the typhoid bacillus has to compete for its existence must be reckoned with. Moreover, as Dr. THOMSON indicates, no investigation, however comprehensive, of soil in relation to endemic enteric fever would have much prospect of success if it were restricted to a single locality. We trust that the Medical Department of the Local Government Board, to which we already owe so much of our knowledge of the etiology of enteric fever, may be able to extend its researches in this matter into a wider field and to investigate endemic enteric fever differentially in typical instances in different parts of the country.

MR. GEORGE EASTES, on assuming the responsible position of President of the Metropolitan Counties Branch of the British Medical Association, delivered an address entitled "Our Numbers and our Work at the Close of the Century," which is of considerable interest to the medical profession. The general conclusions to which he came on this important subject may be summed up as follows:—that there are great fluctuations within comparatively short periods in the numbers of the profession and therefore, of course, in the amount of work for medical men to do; that there is a great variety in different parts as to the proportion of medical men to population; and that of recent years there has been a marked tendency to increase in the numbers on the Medical Register whilst general medical work has, from the operation of many causes, undergone marked shrinkage in several directions. Mr. EASTES is of opinion that the work for medical practitioners to do is not likely to reach its former dimensions except under very special and temporary circumstances, as in the recent epidemics of influenza; and, speaking generally, that the outlook for medical workers is that they are likely to work under conditions of ever-increasing competition. Recognising, perhaps, that he has given rather a pessimistic forecast of the immediate future for medical men, he does his best later to correct such an impression and shows that there are some facts on the other side—happy spots where rivalry is not so keen, an ever-widening empire in which the demand for medical practitioners is felt, and the occurrence of wars in various parts which entail a sudden and an enormous increase in the demand for medical men. "Give to us peace in our time" is, we are sure, the prayer of the medical man as truly as it is that of every good citizen, but it cannot be denied that times of war create a demand for medical service.

There are places in the kingdom where, if mere numbers of patients can make practitioners happy, their bliss should be without alloy. Mr. EASTES shows that the proportion of medical men to population in Huddersfield, Norwich, Hull, and Bolton is very low. The happy practitioners of these towns have theoretically over 2000 persons dependent upon each of them for medical attendance. The other extreme is to be found in Brighton, where in 1881 there were only 741 persons to each practitioner, and where now there are only 615. The practitioners of London come next in paucity of patients, having each barely 800 persons to attend. Mr. EASTES tells us that in South Paddington, where the population has grown less by 3000 since 1861, the numbers of the profession have increased by 20 and the average of persons for each practitioner can be very few more than 300. The practitioners of these districts ought obviously to be in a very bad way, but we are not aware of any facts which go to show that they are more unhappy or less prosperous than those in Huddersfield or Norwich. Probably it will turn out that the mere number of possible patients is not the chief factor in the prosperity and happiness of the profession. It is more important for medical men to have a number of clients to whose needs they can do justice and by whom they can be adequately appreciated and rewarded. It must be remembered that these figures are subject to fluctuation in every locality, while the proportion of medical men to their patients throughout the kingdom is also constantly changing. For

example, in 1881 it was as high as 1718; now it is as low as 1393, which is almost identical with the proportion in 1861. Mr. EASTES quotes the late Dr. FARR as having 25 years ago said that the medical profession would not grow in proportion to the population and as having feared that "there was imminent danger that medical attendance might become quite inaccessible to vast numbers of people." Dr. FARR is not the only authority who has been thus apprehensive. The late Lord PLAYFAIR used to address warnings to the same effect to those who advocated bold measures for straitening the gate of the medical profession so that few should enter it. And undoubtedly it would be possible to carry such measures too far. The medical art, it must be remembered, is a necessity to all classes. The poor and the humble have the same need of it as the rich and the luxurious classes. But there is no immediate need for much anxiety on this subject, for the additions to the profession amount to hundreds every year. There are, however, some new facts in the problem which must not be overlooked. In 1861 there was a large class of unqualified assistants who did, roughly perhaps, a third or a fourth of the work of general medical practice. That element has been eliminated by the action of the General Medical Council or is in course of elimination. Medical work has been multiplied in various ways by the specialisation of medicine and by the great developments of medical education. The growth of wealth and of commerce involves an increased demand for medical service in all its branches—sanitary, medical, surgical, and special. Then there is the great development of our empire which throws so much serious responsibility on us for the welfare of those by whom it is extended and of the communities which come by their agency under our rule and care. Nothing in the last century can exceed the significance of the events which are happening while we write, teaching us that the millennium is yet distant and that enormous medical and surgical and sanitary problems will have to be solved before Africa and China can be brought within the pale of civilisation as we understand it.

Mr. EASTES thinks that the work of the general practitioner is much less than it was 30 years ago and that it is likely to continue so. The isolation of infectious disease and its treatment by the State, the abuse of hospitals, the multiplication of cheap dispensaries, the growing tendency of the public to take their advice from consultants and specialists of all sorts, all tend to lessen the work of the general practitioner and to lead Mr. EASTES to the conclusion that the profession is overstocked. Such facts are very important and call for much consideration, but we do not regard them as ultimate facts that are to dominate and degrade general medical practice for all time. In the very nature of things the general practitioner must always be the first and chief resource of the public needing medical advice. Palpable abuses which affect him injuriously will not last for ever. The general practitioner must meet the competition of consultants by dignified protest or by specialising his own education. He has only to perfect himself as a general practitioner to make himself indispensable in every community and to make the consultant in nine cases out of ten a luxury.

Annotations.

"Ne quid nimis."

THE CENTENARY FESTIVAL OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

ON Thursday, July 12th, Sir William Mac Cormac was unanimously elected President of the Royal College of Surgeons of England for the fifth time in succession. No one has previously held the position for so many years, although the late Sir William Savory was President from 1885 to 1888. Thus Sir William Mac Cormac this year holds an exceptionally honourable post. The centenary festival of the Royal College of Surgeons falls in troublous times. One hundred years ago the shadow of the domination of the First Napoleon, who for a brief space held continental Europe under his feet was just beginning to obscure the sun of liberty. To-day Europe and the United States of America stand confronted with the shadow of a far more barbarous tyranny arising from that race of which 1500 years ago Attila was the incarnation. But the forthcoming festival is in reality a peace congress, a living testimony to the advance of the art and science of healing, and it is fitting that its chief should be one so lately returned from ministering on the battle-field.

THE TRAGEDY AT PEKING.

AFTER many days of conflicting rumours in which men expressed opinions and hopes that their reason refused to justify it has been borne in upon the civilised world that every man, women, and child in Peking foreign to China, and every Chinese native known to be in personal or religious sympathy with them, is dead. What horrors may have accompanied those deaths it is best not to conjecture, while the stories that have been circulated as to the way in which the women and children met their deaths within the walls of the British Legation are founded entirely upon imagination. Letters have been received in England speaking of revolvers carried by women in anticipation of the worst, while it is stated upon good authority that Lady Macdonald, the wife of the British Minister, went armed with poison even before the actual outbreak took place, knowing that she might need it for herself and for her children. In this course she cannot have been alone, but the actual events of the terrible closing scene are still unknown to us and may never be other than unknown. There have been massacres before where the natives of savage countries have wreaked their hatred suddenly upon the foreigner in their midst, but there has been nothing in history absolutely resembling the tragedy of Peking. England has had experience of terrible outbreaks of savagery at Cawnpore and elsewhere during the Indian Mutiny, and we have ever since had thrown in our teeth by European nations the penalties we exacted in reprisal and in reassertion of our authority. Now each nation of Europe having a political representative at Peking knows that that representative, with wife, children, and household, has been butchered, knows that every citizen it has sent out to spread its commerce, to preach its religion, to disseminate its science and its civilisation has either been slaughtered in the Chinese capital or in some other part of the Chinese empire stands in imminent danger of a hideous death, and the spirit that is abroad is certainly not one of meek forgiveness. Europe will exact a reckoning, though to whom the bill should be presented is, in the present state of our information, obscure. Every day makes it clearer that

the outbreak is not merely the work of a secret society in rebellion, too strong for the Imperial Government to cope with, but a national movement with which many in high places connived, which was incited and abetted by those who at different stages have professed hostility towards it, and with which the majority of those responsible for the government of the country sympathised in their hearts if not with their voices. In such circumstances it seems inevitable that there should be a war in which the combined forces of Western civilisation will meet the vast hordes that an ancient Eastern civilisation—for up to a point the Chinese are a civilised nation—can bring against them, and that such a war should be primarily a war of vengeance. Chinese cruelty and treachery have been brought home to European nations before, but an act that simultaneously involves them all with America and Japan in the cry for reprisals must, if the act is brought home to the Chinese Government, produce extraordinary consequences. The Chinese may possess an ignorant mob, but the mob has been led in its fury and instigated to its crime. Those who govern China are not uncivilised savages and cannot claim indulgence as such. Centuries have elapsed since their ancestors first rejected our envoys and refused to let them reside at their capital; since then they have for years had their own accredited representatives at European courts, while Chinamen of all classes have been brought into contact with Europeans all over the world; and yet the blow has been allowed to fall without warning, and as far as can be judged every artifice of Oriental duplicity has been employed to conceal the truth as long as concealment was possible. It may be easy to justify the resentment of the Chinese people at the encroachments of foreigners, or at what it has regarded as such; and to explain that the efforts of missionaries to propagate Christianity have not only been comparatively fruitless but have given opportunity for rousing all classes against all strangers whether missionaries or not, but the nations now apparently united in a common cause will not be easily persuaded that the tragedy of Peking, and others perhaps of less magnitude but no less terrible, that may follow, could not have been averted or delayed by those who can be made in some degree responsible. At present all the principal nations of the world seem in the last years of the nineteenth century and within a year of an international peace conference to be on the brink of a war that will demand for its successful prosecution all the resources of their science and civilisation, while all the moderating influences of Christianity and civilisation will be needed to limit its duration and mitigate its horrors. Possibly not till it is ended shall we know at all accurately what has already taken place, while it seems likely that the fate of individuals will, perhaps mercifully, remain for ever veiled. Among these are members of the medical profession. Some have been named already and our readers must be able to reckon others among their friends or acquaintances who may, or may not, have taken refuge in the capital hoping for comparative safety there. Others, again, at present survive, settled in towns that once seemed to be safe or scattered and isolated in spots where they hoped to benefit fellow-men, combining mission work with medicine. For all these the outlook is a very grave one, and if we may be cheered in time by finding that the rising has spread less widely than has been anticipated we may, on the other hand, still have news to face even worse than that which has come to hand. To all those, therefore, who have given up hope for those whom they loved, or who are suffering from the heavy strain of anxiety on their behalf without news to relieve it, we tender our deep and sincere sympathy.

THE LUNACY SCANDALS IN ST. PANCRAS.

As we announced in our issue of July 14th the Local Government Board by means of their inspectors, Mr. H. Lockwood and Dr. A. H. Downes, opened an inquiry on Tuesday, July 10th, into the alleged irregularities which have recently taken place with regard to the certification and removal of lunatics. The inquiry closed on Thursday evening, July 12th, and the evidence taken was chiefly that of parish medical officers and of relieving officers. Evidence showed that the relieving officers expected to get "tips" from both parish medical officers and from the proprietors of private lunatic asylums. If they did not get their tips from the parish medical men these latter got no lunatics to certify. Mr. Lockwood adjourned the inquiry, so at present we shall not comment upon the matter, it being practically *sub judice*. We may mention, however, that the Local Government Board have issued a letter to clerks of boards of guardians in which, without referring by name to any particular parish, they say that they know that payments have been received by relieving officers from parish medical men and proprietors of licensed houses in connexion with the certification and admission of lunatics in at least two parishes. Further, they have reason to believe that this practice exists in other parishes. The Board therefore wish it to be understood that they consider the practice as indefensible and that no officer offending in future should be allowed to retain his post. This expression of opinion does not mean that the past will be condoned.

SIR WALTER FOSTER AND THE MEDICAL ARRANGEMENTS AT THE SEAT OF WAR.

REFERRING to an annotation in THE LANCET of July 7th Sir Walter Foster courteously furnished us with a reference to the seventh edition of Parkes's Practical Hygiene as the authority for his statement that in the opinion of the late Professor de Chaumont the amount of hospital accommodation to be provided for an army on field service should not be less than 25 per cent. We have now had the opportunity of verifying the correctness of Sir Walter Foster's quotation, which we gladly acknowledge. This amount of hospital accommodation struck us at the time as being very large and as impracticable, if not, indeed, unnecessary, for a force operating under the conditions and circumstances that ordinarily obtain in modern warfare. We desire to add that we are not only justified in holding that opinion, but in now claiming it as that also of those responsible for the subsequent edition (the eighth) of Parkes's Hygiene, and we can only regret that Sir Walter Foster did not prosecute his inquiries a little further by quoting the latest edition of that work in making a public statement, in which case he would have escaped being misled himself and of unwittingly misleading the House of Commons. The seventh edition of Parkes's Hygiene, edited by Professor de Chaumont, was published in 1887. A good deal has happened since then. In the succeeding edition (the eighth) published in 1891 and edited by Professor Lane Notter, the present professor of military hygiene at Netley, we read: "*Amount of hospital accommodation.*—This must not be less than for 10 per cent. of the force, with reserve tents in rear in case of need." This quotation is from page 674, Chapter VI. We could understand that for exceptionally unhealthy climates and seasons an exceptional rate of hospital accommodation might, of course, be necessary, but for an army of a strength of 200,000 operating in a climate like that of South Africa 25 per cent. seemed to us an unreasonably high estimate. But assuming that there had been hospital accommodation for 50,000 sick and wounded in South Africa we fail to see how it would have availed to meet such an emergency, say, as that

of a force outmarching its supplies—unless it was known beforehand where the army was going and the hospital supplies could have been sent there in advance. Be this as it may, there are a few other points to which we may take this opportunity of referring in connexion with the mortality of typhoid fever. If Sir Walter Foster will refer to the *Times* of July 12th he will find a communication from Mr. Sydney Holland in which Mr. Holland seeks to correct an erroneous inference deducible from a previous letter. Mr. Sydney Holland gives a statistical table of typhoid fever cases admitted into the London Hospital from 1895 to 1899 (inclusive) from which it will be seen that the rate of mortality per cent. among males between 20 and 30 (soldiers' ages) was 22·35. As regards Brand's statistics they do not seem to us to be to the point, unless the ages of the patients are stated and we know how many of the shortest and mildest forms of fever were included to make up the totals. If we recollect aright, too, those tables were to illustrate the beneficial results of the cold-bath treatment of typhoid fever, and we can scarcely suppose that Sir Walter Foster expects that this method of treatment can be had recourse to under all the conditions of war.

THE NEW INFIRMARY OF ST. MARY'S, ISLINGTON.

ISLINGTON justified its old title of "merrie" by the way in which its inhabitants received the Duke and Duchess of York on Monday, July 16th, when they went to open the new infirmary which is expected ultimately to have accommodation for 800 people. Nothing could be more satisfactory than the opening ceremony, and nothing could be more sensible and to the point than the address of H.R.H. the Duke of York. Whatever difference of opinion there may be about the expediency of providing palatial residences for paupers, there can be none about the propriety of providing infirmaries for the sick and dying poor with every amenity that can mitigate their suffering and give them a sense of being cared for and considered. The guardians of Islington confess to an expenditure on this institution of £273,000 and we shall not be far wrong in reckoning that it will cost the ratepayers £300,000 before it is finished. This is a royal expenditure and could scarcely have been exceeded by the Metropolitan Asylums Board. But it is not too much if the ratepayers and the poor for whom they cater have got a *quid pro quo*. We are not satisfied on this point. The beauty of the whole is spoilt by the way in which the various parts of the brick building are jumbled together. There is an absolute absence of all grace of structure and architecture. The operating theatre and the laboratory, which should have been cheerful and light chambers, were dark and dismal even in the bright summer day of the opening ceremony. It is perhaps premature to judge the operating chamber, but its essential faults of structure and lighting and the absence of safeguards against septic organisms are very obvious; such safeguards, too, are conspicuous by their absence in most of the wards. It is gratifying to us to be able to hope that there are no medical men on the building committee who must bear the responsibility of this building, which might have been graceful and perfect in its way, and ought to have been so considering the money of the ratepayers which has been lavishly spent upon it, but which in point of fact is in every way disappointing.

MR. LONG AND RABIES.

IT is probable that no one in England has been more abused by a certain section of the dog-owning public than has the present Minister of Agriculture. The application of the muzzling order has been the cause of a good deal of excitement at various times, but the results which have been attained have fully justified the means employed. There is less rabies in Great Britain than there has been for many years; in fact, it may be said to be practically stamped out. This splendid result, which has been achieved over a terrible disease at the inconvenience only of the canine world, is solely to be attributed to the energetic measures taken by Mr. Walter Long and his veterinary advisers, and too much praise cannot be given to those gentlemen for what they have done. There is no more awful disease, either in man or animals, than rabies, and the enviable position which has been attained for this country in being able to declare itself practically free is one which must be maintained at all costs. Strict quarantine regulations with veterinary and police supervision for a certain period of time are annoyances which owners ought to consider as very trivial when compared with the advantages and safety that they confer not only upon themselves but also upon their pets. According to the returns of the Board of Agriculture there were only nine cases of rabies reported in 1899, whereas the corresponding numbers in 1896, 1897, and 1898 were 438, 155, and 17 respectively in dogs alone, whilst in other animals no cases occurred in 1898 or 1899, but in 1896 and 1897 the numbers were 22 and 36 respectively. These statistics speak for themselves and although the time cannot be very far off when the muzzling order will be removed from every part of England it is to be hoped that if any error is made in this direction it will be rather on the side of safety than otherwise. Mr. Long has indeed earned the gratitude of the country for the extinction of rabies alone, and as a nation we are to be congratulated upon having a Minister of Agriculture who has so perseveringly carried through to a successful termination a measure which for a time caused a great outcry and brought down upon his head a violent torrent of sarcastic criticism.

THE EPIDEMIC OF FORTUNE-TELLING.

So long ago as March 31st last a person described as Zuleika Cavalier, aged 30 years, and married, was brought before the magistrate at Marlborough-street and charged with telling fortunes at an address in Bond-street. After being remanded she was eventually fined £25 and ordered to pay £10 costs, upon which she gave notice of appeal. In view of the appeal we did not criticise her case at the time, but now that Mr. McConnell, Q.C., sitting as Chairman of the Court of Quarter Sessions at Clerkenwell, has dismissed the appeal with costs we are at liberty to do so. The prosecution of gypsies for cozening servant-maids out of their wages by promises of wealthy suitors and other desirable prospects are more or less frequent, but it has been a matter of observation that of recent years persons professing to tell fortunes for the benefit of those moving in higher social circles than these have been permitted to ply and advertise their trade in the more fashionable streets of London and other towns with openness and impunity. We need not recapitulate the evidence given against Zuleika Cavalier, but we note that among the materials for her conviction found by the police in her room was a correspondence with a married woman who had inquired when she would be a widow and also as to who would be her next husband. It seems clear from such instances as these, if it required demonstration, that there are women who need protection from the suggestions of the fortune-teller apart from those whose credulity may merely cause them to suffer in pocket. The various devices most often associated with the ambition to pry into the future are of venerable antiquity, but Zuleika Cavalier does not seem to have earned the £1500 a year with which the police credited her by following

the methods of the orientals in whose costume she masqueraded. Perhaps her visitors were so numerous that she had no time to linger over her divination. She did not use the tarot or tarots, cards in a pack of 78, a very ancient device popular with gypsies of all ages and, as it seems to us, a somewhat mechanical means of lifting the veil of futurity. Nor did she produce in herself hypnotic conditions by gazing into the crystal ball or the ink-pool, a far more imposing and at least as venerable a form of divination; nor did she indulge in an exhibition of cheiromancy, lithomancy, pyromancy, or kapnomancy. According to her own account she adopted a plan which if not picturesque was businesslike and not altogether without precedent: she shut her eyes, ejaculated a prayer, touched the hand of her subject, and proceeded forthwith to see "mental pictures" on his behalf. These pictures in the case of the Hon. A. Macdonnell, to whom the public is indebted for the recent prosecution, were of a decidedly definite rather than of an impressionist character, one of the incidents foretold to him being that he would shortly receive a portrait of one of his ancestors anonymously and would find at the back of it a piece of paper leaving him a fortune which would partially atone for a great wrong done to him by an ancestor a long time ago. A lady who has extracted £1400 or £1500 a year from the credulous by simple and romantic tales of this hackneyed type will not find it difficult to pay the fine inflicted on her. She will, however, bear in mind that the powers of the magistrate who sentenced her were not limited to the power to inflict a fine and that moreover on a second conviction for a similar offence they are considerably increased, as he is then empowered to deal with her as an "incorrigible rogue." At the same time she will have good cause of complaint if after she has herself been punished according to the law her numerous rivals in trade are allowed to flourish in defiance of it.

REST-HOUSE *v.* WORKHOUSE.

WE have frequently pointed out that our modern Poor-law, forced into existence as it was by the spoliation of the monastic institutions which formerly ministered to the poor, was hopelessly defective in one respect—namely, that no line of demarcation as to treatment was drawn between those who had failed in life from sickness or bad fortune and those who were idle, drunken, and improvident. That a man or woman who had worked all his, or her, span of working life should when no longer able to work be relegated to the same place and the same treatment as the tramp and the loafer is not only inhuman but immoral, and we therefore offer our warmest congratulations to the guardians of the poor of St. Olave, Southwark, for the new departure which they have taken. The new rest-house, for so it should be called, is situated at Ladywell, and was formally opened upon July 12th by the Prince and Princess of Wales. The total extent of the site is 34 acres and there is accommodation for 812 persons. Although, of course, the institution is still under the Poor-law the inmates will be treated in a manner as home-like as possible and the stringency of workhouse regulations is much relaxed. In the words of Mr. Shand, the chairman of the board of guardians, the building is to be a "home of rest for those worn-out sons of the State who through no fault of their own have come to poverty in their old age and are in need and necessity." The Bishop of Southwark opened the proceedings with prayer and the Prince of Wales in a few simple words expressed his pleasure at the new departure in the treatment of the aged and infirm poor. The Bishop then pronounced the benediction and the proceedings ended. Ratepayers rightly grumble at the enormous sums which they are compelled to disburse for educational experiments, but no one will complain at having to pay to make the close of life easier for those who have reached the last stage of their pilgrimage here.

A FRENCH CRITIC ON BRITISH ARMY SURGEONS.

M. JEAN CARRÈRE, the able special correspondent of the Paris *Matin*, is now in South Africa. In the course of his very interesting letters he has on several occasions spoken in high terms of the British army surgeons with whom he chanced to make acquaintance. In a recent letter he described a visit to the hospital ship at Simonstown where he went to visit a French prisoner, M. du Feissal, who was wounded by the same shell which killed Colonel de Villebois-Mareuil. On reaching land again M. Carrère writes as follows, and in translating we seek to preserve his colloquial unconventional style:—

"We entered an hotel where they served us with unnameable things which we watered with a doubtful Moët violently acidulated. Then who should turn up but Dr. Carré whom we had searched for all the day. Thus we must never despair of anything. I am introduced. Dr. Gerard Carré, as his name indicates, is of French origin. He is young, about 30, fair, aquiline nose, fine beard, blue eyes. We drink and are 'chums' at once. He speaks to me about his patients with a fraternal gentleness that touches me and goes straight to my heart. I then remember the letter of Dr. Roë. What delightful beings these doctors are; and if ever I have said any evil about them I tender to them all collectively my apologies. During my journey I have frequented many of them and I have taken to love them sincerely. Evidently they do not cure death; but really, is that quite necessary? In my opinion they do better than this. They bring us the illusion of the life everlasting. And then, and above all, they are men of heart. From whatever country they may come they are all the same. The habit of living on the frontiers of humanity has conferred on them all pitiful and indulgent souls; and in the perpetual tumult of passions and conflicts, between men and races, they are the link of all possible concord and form in their immense federation of the Red Cross the International of Mercy."

ADULTERATED VINEGAR.

THE addition of sulphuric acid to vinegar, though in small quantity, is apparently still practised according to the recent report of the medical officer of health and public analyst for St. James's, Westminster, Dr. James Edmunds. He reports four cases dealing with this impurity in vinegar which were "tenaciously defended by manufacturers standing in the background." Convictions, however, were obtained in all the four cases. The chief question at issue in these cases is, it seems to us, whether such an addition is injurious. In a great number of instances there is no evidence forthcoming to show that the use of substitutes or the addition of preservatives or foreign substances is actually injurious to health, but we have always maintained that unless the purchaser is supplied with exactly the article which he asks for fraud is committed. In other words, if an article is substituted for the one demanded a case for prosecution is immediately established, although the substitute may be perfectly wholesome and non-injurious to health. These observations apply to vinegar. A pure malt vinegar should be nothing but what is in reality pure beer soured by acetic fermntation. But until the law states very precisely what this and other articles should consist of the increasing tide of substitutes will never be stayed. We doubt whether such a requirement will ever become a law of this country; it would not be practicable to enforce and it would be a source of great inconvenience, especially to the poorer class of consumers. The enormous increase in the consumption of food entailed by an ever-swelling population in our big towns and the demand for cheaper articles have brought about an

inevitable result—the production of various articles of food on a much larger scale and at a much cheaper rate. The materials used of yore have thus necessarily given place to substitutes which in their way are good and wholesome enough, although they cannot be regarded as conforming to the standard of the article produced in the time-honoured way. Beer may be quoted as an example. There is very little beer produced in this country which is brewed entirely from malt and hops. Both grain and bitter substitutes are employed and these produce an excellent and wholesome beverage, but it is not beer if we accept the definition of that article of consumption as being a fermented infusion only of malt and hops. We are inclined to take the view that the object of manufacturers on the whole is more to effect economy and to supply an attractive and uniform article than to create mischief. Indeed, in some instances different modes of manufacture have been adopted in accordance with modern scientific knowledge which have resulted in a better product. Though, strictly speaking, such recourses are not absolutely necessary, yet for all modern practical requirements they have become indispensable. It seems to us that there should be no difficulty in deciding when a manufacturing practice is objectionable or upon the suitability of a substitute for human consumption, while there can be no doubt at all as to the course to be taken when an article of food is proved to have been misnamed. This is exactly one of those matters with which we had hoped that the court of reference which it was suggested should be appointed to control the operations of the new Food and Drugs Act would deal.

EMPHYSEMATOUS GANGRENE FROM INFECTION BY THE BACILLUS AEROGENES CAPSULATUS.

IN 1891 Dr. Welch of the Johns Hopkins University reported the discovery of a gas-producing bacillus in the blood and tissues of a man who died after rupture of an aortic aneurysm. In 1892, with Nuttall, he published a study of this organism which he named the "bacillus aerogenes capsulatus."[1] It is one of a number of organisms capable of producing gaseous necrosis of living tissues—emphysematous gangrene. Koch's bacillus œdematis maligni is another organism of this group. Recently we have referred to cases in which gaseous abscesses followed hypodermic injections from infection by an organism discovered by Veillon and Zuber in various fœtid and gangrenous abscesses and termed by them the "bacillus perfringens."[2] In the *Boston Medical and Surgical Journal* of June 7th Dr. Paul Thorndike has described two cases of infection with the bacillus aerogenes capsulatus. A man, aged 45 years, fell to the ground from a height of 10 feet, sustaining a compound fracture of both bones of the forearms. Under ether the wound was thoroughly cleansed with sublimate solution and a sterile dressing and plaster-of-Paris were applied. At the end of the first day the plaster-of-Paris was removed in consequence of the pain. There was semi-delirium and the temperature was 102°F. On the following day cyanosis of the fingers and great swelling and emphysema of the forearm were present. On the third day he failed markedly and the emphysema extended to the shoulder and chest. Amputation was performed at the shoulder-joint. Both flaps were emphysematous. He rallied well, but 36 hours after the operation the septic symptoms returned and he died two days after the operation. The arm when removed was much swollen and tense. The forearm was of a deep plum-colour and the hand and fingers were dusky-red. Bullæ varying from five to 25 millimetres in diameter, filled with clear serum, were irregularly distributed over the forearm. Everywhere below the elbow the tissues were like a cushion and the slightest pressure produced crackling. In the upper arm along the brachial trunks crackling was also present. From a puncture in the forearm serum and gas were poured out. The cut surface was gelatinous and in parts semi-diffluent. Sections from several areas in the forearm showed its invasion by a long bacillus which had all the characteristics of the bacillus aerogenes capsulatus. In the spleen microscopical examination showed several foci of the bacillus. In the second case a man, aged 33 years, had compound fracture of the leg. On the third day the foot was cyanotic and painful and bluish mottled spots appeared on the leg. On the fourth day the leg was covered with blebs and there was a foul discharge from the wound. Emphysema appeared and extended above the middle of the thigh. Amputation was performed at the middle of the thigh through diseased tissue and drainage was provided. On the seventh day emphysema reached Poupart's ligament. Under ether long incisions were made in the crepitating area and the disease ceased to extend. Recovery ensued. Dr. Thorndike insists upon the necessity of operating as early as possible in these cases, and he thinks that the operation in the first case was performed 24 hours too late.

[1] Johns Hopkins Hospital Bulletin, vol. iii., 1892, p. 81.
[2] THE LANCET, April 7th, p. 1021.

THE CHEMISTRY OF SOOT.

THERE is a very general impression prevailing that soot is simply carbon, but chemists have long known that though carbon is its chief constituent yet there are present other elements, amongst which hydrogen and nitrogen may be counted as of some importance. Indeed, it has been stated that soot is an impure hydrocarbon containing a very large proportion of carbon relatively to the amount of hydrogen. Soot possesses some peculiar properties. As everybody knows, the fact of the very characteristic and so-called smell of soot being in a domestic apartment generally portends wet weather or it may occur simultaneously with the onset of hot weather. It is probable that a reduction in the height of the barometer and an increased amount of moisture in the air are conditions which combine to expel a substance from the soot of our chimneys the peculiar smell of which is so noticeable in the room. The smell suggests ammoniacal compounds, and we are not surprised to find that a recent analysis has shown that soot contains no less than 7·4 per cent. of ammonium salts. This fact amply accounts for the value placed on soot for agricultural purposes. Again, it may be remarked that soot on burning in a more or less confined area (as in the case of a chimney on fire) evolves a characteristically persistent and most nauseous smell. This peculiar characteristic is likely enough due to the presence of nitrogenous organic compounds. Needless to add it is very probable that partly on this account the horrible fumes emitted from a chimney on fire are intensely poisonous; and on this ground alone punishment should be severely dealt out to the person who allows this disgusting pollution of the air to take place.

A FORGOTTEN PHYSIOGNOMIST.

AT the present time the study of physiognomy has dropped so much out of sight that we are apt to forget the exaggerated importance that was attached to it in the distant past. The first student of physiognomy on record is Aristotle, who invented the term to designate the art of discerning character in man by means of the features of the face. Cicero was a notable physiognomist, but it was not until the dark ages began to be illuminated that the subject attracted popular attention, enlisting numerous exponents. In the eighteenth century Le Cat and Pernethy both produced elaborate essays on the subject, inaugurating the system

which is at present followed, but the best known authority during this period is Lavater who was led to undertake "the study of Physionomies" by "the turn of the neck" in a soldier who happened to pass by a window where the "citizen of Zürich" was standing with his friend "Mr. Zimmerman, physician to his Britannick Majesty of Hanover." Lavater informs us that he "began oftener than once to study the authors who have written on Physiognomy, but was soon disgusted with their verbose jargon ..... most of them chiefly pilfered from Aristotle." There is, nevertheless, an earlier physiognomist whose work, whatever may be the verdict as to verbosity, is certainly not jargon. Long buried in oblivion this remarkable volume, which bears the date of 1615, was brought once more to light a year or two since by Professor Mantovani of Bergamo. The name of the forgotten author is Samuel Fuchsius, but whether or not he was a relation or descendant of the celebrated botanist is uncertain. On his title-page he informs us that it is his purpose to treat of the "symptomatic values of the forehead and eyes in determining the characters as well as the ntellectual and affective aptitudes of men." Besides an introduction the treatise comprises 34 chapters, of which 15 are devoted to metoposcopy and 19 to ophthalmoscopy, both divisions being profusely illustrated by portraits, plates, and diagrams in the most approved style of the period. "I expose," says Fuchsius in his exordium, "if not perfectly at least to the best of my ability and in all honesty, the substance of physiognomy: if many bewail the sad fates of Cato and of Cæsar, the victims of adversity, how much more rational would it not be to explore the destinies of our own contemporaries and to foresee with quasi-divine prescience how much of criminality and how much of rectitude each one of us bears within him? You may, O Mortals! entrench your voices behind the double rampart of your lips and teeth, but for all that your foreheads and your eyes will continue to afford an infallible means of detecting your inmost thoughts in all their bareness, devoid of all the disguises of fiction." Before entering into details Fuchsius at considerable length, and exhibiting a quaint mixture of determinism and pessimism, maintains that since all qualities, good, bad, or indifferent, are part and parcel of human nature it follows that the means of giving outward and visible expression to those he possesses must necessarily exist somewhere in each individual's body. Then taking his examples from among the sculptured effigies of historic personages he proceeds to substantiate with more or less success the correctness of his theory. Foreheads he divides in the first place into large and small. "A small forehead is the index of a small, narrow, feminine mind, and rarely will the owner of such an one be found endowed with the qualities which conduct to the temple of glory and renown: he will be irascible, curious, prone to averge himself, and credulous of falsehoods and old wives' tales." Next the author passes in review a whole regiment of foreheads of different shapes and sizes—long, broad, low, round, square, projecting, retreating, &c. Criminals with ambitious proclivities, such as assassins and highway robbers, have narrow foreheads; in fact, it is in people of this description that the minimum diameter is to be met with. A low-type forehead shown in one of the illustrations is remarkable as presenting an almost complete collection of the modern stigmata of degeneracy; and equally worthy of observation it is that Samuel Fuchsius in the seventeenth century should have regarded a profusion of coarse hair as usually associated with a feeble or disordered intellect. Among many other interesting points commented upon in the first part of the book the wrinkles in the foreheads of melancholiacs and also in those of the newly-born children of elderly parents may be mentioned. In the second part, under the head of Ophthalmoscopy, Fuchsius again displays wonderful perspicacity. More even than the forehead, he says, the eye is capable of betraying the most delicate play of passion in the human mind, as well as of indicating with the utmost preciseness the degree of intelligence which the individual possesses. In considering the eye we should take note of its accessory in addition to its essential parts. Heavy eyebrows are an attribute of robbers, liars, and homicides. When straightly drawn they denote sadness; if arched, arrogance; if bent inwards towards the root of the nose, austerity. Large eyes reveal laziness; small eyes are found in cowards and misers. An episcleral circle marks premature senility; strabismus is often the outward sign of partial amentia; while pigmentary anomalies in the iris betoken eccentricity and imbecility. "Eyes which are apt to tremble and be convulsed upwards indicate the sacred disorder, but are likewise a characteristic of cruel men, of murderers, and of all persons possessed by malignant spirits." The passions and affections, without exception, have their indices in the human eye. The descriptive list supplied by Samuel Fuchsius is admirably conceived and executed, but its great length renders it exclusory.

THE EARLY RECOGNITION AND TREATMENT OF NEUROSES IN CHILDHOOD.

DR. CHARLES L. DE MERRITT deals with this important subject in a paper published in the *New York Medical Journal* of June 16th. He refers to the common existence of hysteria and neurasthenia in children and urges the importance of recognising the symptoms early, as he believes that a majority of such cases among adults have their insidious beginning in childhood. A medical practitioner who is consulted by parents about an irritable, highly-strung, eccentric child will often give some commonplace advice about diet, rest, &c., and generally tell the parents that "the child will out-grow it," which assuredly he or she often will not. The neurotic element or morbid taint present is not detected in time, and for want of proper moral and hygienic restraint the child grows and reaches maturity with his or her nervous force already exhausted, "another recruit for the army of neurological wrecks whose existence is one of the most appalling problems of present-day society." In such cases it is often possible to trace heredity both as a direct and an indirect factor. By the latter is meant the deleterious influence exercised in infancy and early childhood by neurotic parents who scold and nag their children incessantly and yet have not the will power to enforce real discipline so that what little of mental equilibrium the child may possess is speedily destroyed. As regards overstudy in school Dr. Merritt does not regard it *per se* as the chief factor of breakdown in school children. "German children," he says, "study harder than ours, yet they collapse much less often because their home life is more sedate and precocity is suppressed, not encouraged as is too often the case in American homes." Lack of exercise and of fresh air are prolific causes of neurotic troubles. Other causes are poor or insufficient food, anæmia, and the infectious fevers. The symptoms most frequently met with are insomnia and pavor nocturnus, great irritability of temper and disposition, a tendency to lie and to impose upon people for no apparent reason but the love of so doing, masturbation, fits of crying and paroxysms of passion upon little or no provocation, habitual feigning of illness, and an undue desire and craving for sympathy. With reference to treatment the parents must first be scrutinised, the anomalous symptoms must be traced to their source and treatment must be adopted accordingly as experience directs. Rest from school study must be prescribed with caution, for the relaxation of the mental and moral discipline of school life may harm rather than benefit a young

hypochondriac who is disinclined to associate with his fellows, who prefers solitude, and who broods over his feelings. The gymnastics now taught in most schools constitute a very valuable means for promoting physical health and they deserve encouragement. If the parents are themselves neurotic and hypochondriacal it must be explained to them how such defects react upon the child and how the mischief of imitation should be obviated. Drugs are of secondary importance. Bromides and hyoscyamus may be used for a time, and warm sponge-bathing at bedtime is also useful. The distinction between hysteria and neurasthænia is of little practical importance in children and does not affect to any extent the treatment to be pursued.

A MEDICAL MAN'S HUNTING ADVENTURE.

IN his interesting and profusely illustrated work, "Under the African Sun" (London: William Heinemann, 1899), Dr. Ansorge graphically describes an exciting adventure which happily was not attended with the serious consequences that at first seemed probable if not inevitable. While he was crawling away "on all fours" from a wounded rhinoceros the author's Martini rifle which he was dragging along with the left hand suddenly exploded, its muzzle at the time being pointed at his left foot and almost in contact with it. He supposes that the trigger caught in some stubble, but be this as it may the bullet passed clean through his foot drilling a hole at the base of the great toe where it joins the metatarsus. The two natives who were with Dr. Ansorge at once jumped up and ran away, whereupon he too jumped up and ran, but within 50 yards or less he sank to the ground overpowered by the pain. Fortunately the vision of the rhinoceros is very dull; the animal galloped off without seeing any of the party, and so the wounded man was able to attend to his injury. With great difficulty he succeeded in removing his heavy shooting-boot and blood-stained sock, but by that time the toe was cold, blue, and apparently dead. Tearing off a long strip of cloth to serve as tourniquet and bandage, Dr. Ansorge contrived to staunch the flow of blood, and as he luckily had a light network hammock with him his servants found no difficulty in carrying him back to Fort Smith. "What worried me on the way," he adds, "was not so much the pain as the thought that, if the great toe was really done for, I should have to amputate my own toe, not a very pleasing prospect; or, as an alternative, something even more disagreeable to contemplate, I should have to ask one of the officials at the fort to cut the toe off, and not one of them had the necessary surgical knowledge." However, "all's well that ends well"—during the three hours occupied by the return journey the collateral circulation had time to establish itself, and eventually under simple antiseptic treatment the digit became for all practical purposes as good as ever. At first there was considerable stiffness of the joint, but the long tendon upon which so much of the movement of the hallux depends became thoroughly reunited, although it had been completely cut through by the bullet, and in the course of a few months the parts had regained most of their original efficiency.

THE NEW UNIVERSITY OF LONDON.

THE members of the respective faculties of the new University, whose names are published in the regulations, are requested by Sir H. E. ROSCOE to attend on Oct. 12th at the University Buildings, South Kensington, at 4 P.M., for the purpose of the elections under the statutes. The elected members will serve upon the Senate, the first meeting of which is intended to take place on Oct. 24th. The members are thus divided in the various faculties: Theology, one; Arts, four; Laws, one; Music, one; Medicine, three; Science, four; Engineering, one; and Economics and Political Science, one. In addition to the members elected by the faculties, 16 will be elected on Oct. 9th by the graduates in Convocation, of whom two will be elected by the registered graduates in Medicine and Surgery, six in Arts, one in Laws, one in Music, and six in Science.

THE NEW PSYCHOLOGY.

DR. HENRY MAUDSLEY has published in the July number of the *Journal of Mental Science* a valuable contribution relating to the new psychology from a critical standpoint. Dr. Maudsley at the outset points out the various and somewhat arbitrary distinctions that have been drawn between the titles "mental science," "mental physiology," "psychology," and "mental philosophy." Under these titles we have at the present day "four formidable systems dealing with one and the same subject, yet having different names, pursuing separate paths, speaking different and mutually unintelligible languages, often hostile in attitude towards one another, almost as averse to meet as parallel lines." Leaving this subject, on which a good deal more could be said, Dr. Maudsley referred to two methods of research lately in vogue and large with promise—viz., the systematic study of child psychology and the so-called psycho-physical research. The results accumulated by child-study require to be interpreted with great caution. It is difficult for the adult to understand correctly and rightly to construe by the light of his ripe thought and feeling, his formed and conscious thought, that which is only forming and scarce conscious in the immature mind of the child. "In the immature mind the word, like the underlying idea or feeling, is simple, single, without associations, almost detached, naked, so to speak, whereas in the mature mind it is involute, containing layers on layers of experience, having manifold associations which are roused into more or less conscious thrills, emotional or intellectual, by every use of it." To strip off or abstract so much of the structure of his own mind as to reduce it to the simplicity of the child-mind, and then to use his so mutilated mind to observe and interpret, is a matter of exceeding difficulty. "He would find it easier, I think, to walk the walk and talk the talk of his infant." To give an illustration: When the child asks the astonished father, "Daddy, why doesn't God kill the Devil?" he puts as simple, correct, and natural a question as he would do were he to ask, "Why does not daddy kill the rat?" One question is not a whit more wonderful than the other. The child has been taught to picture God as a big, strong Being, living out of sight high up above, Who can do whatever He will, loving good deeds and good persons, angry with those who are naughty and do wrong—to picture Him mentally, in fact, as a kind of bigger and stronger father. And reasoning then from the particular to the particular, as incipient intelligence cannot choose but do, the child naturally wonders why God does not kill the Devil who is going about doing wrong and tempting to do wrong. The child's assertions are direct and simple, not trammelled as yet by modifying associations or vitiated by conventional errors and prejudices; therefore his utterance is sometimes singularly fresh, startling, and suggestive. Sentimental persons may detect "intuitions" and "trailing clouds of glory from afar" as they dote on children's innocent simplicities, but it is they, the enraptured gazers, who project them and read them into the child out of their own feelings, just as the fond mother watching the flicker of a smile across her sleeping baby's face projects a heavenly meaning into the purely reflex movement excited by a pleasant visceral stimulus. The real

babe, as a matter of fact, is a selfish parasitic creature, with all its instincts converging towards the animal self, exacting tyrannically all the services which, happily for it, maternal devotion likes instinctively to give. Child psychology should note and watch the performances of children and interpret them by the light of heredity and human evolution. As regards psycho-physics—the creation of Wundt in particular—its promises and expectations were very large, but the performance has been very small. In the end psycho-physics belongs more to physiology than to psychology, for the methods are physiological. Idiosyncrasy or personal equation is a complicated unknown quantity, containing several *x*'s, and this enters into all equations of reaction, time, and other psycho-physical measurements. One person may feel faint because a cat is in the room, another may be poisoned by a strawberry, and a third may be unable to "contain his urine if he hears the sound of the bagpipe"; one may react deliriously to opium where another is not affected with the same dose. There are hosts of subtle and obscure factors entering into the composition of idiosyncrasy and temperament, which must always vitiate the measurements and reaction-times made on different subjects. The extensive and lengthy publications which have been issued from many psycho-physical laboratories must remain monuments of sterile industry, monumental mockeries of knowledge. An impassable gulf lies between measurements of objective reactions and the subjective state which is intangible and for which no common unit of measurement is possible. Man is too complex for psycho-physical measurements.

ARSENIC IN SODIUM PHOSPHATE.

IT must be admitted that the apparently uniform occurrence of arsenic in important quantity in ordinary phosphate of sodium is a revelation, although on reflection there is the possibility of arsenic being contained in all drugs in the preparation of which common sulphuric acid is concerned. Sulphuric acid is used, of course, for liberating phosphoric acid from phosphate of lime and the resulting phosphoric acid when neutralised with carbonate of sodium yields the ordinary phosphate of sodium. Any arsenic present, therefore, is most probably combined with the soda to form arsenate, a salt that in many respects closely resembles the phosphates. It is clear, however, that the contamination of phosphate of soda may become so marked as to render the salt distinctly poisonous. In the remarkable cases which were recently brought under the consideration of Mr. Plowden at the Marylebone Police-court, and upon which last week he delivered, as we consider, a very sensible pronouncement, it was shown that this arsenical impurity might easily amount to a dangerous quantity. The evidence that the arsenic occurred by accident or carelessness may be ignored in view of the fact recently elicited by the examination of a number of specimens of phosphate of soda which all showed the presence of more or less arsenic in the form of sodium salt. Even phosphate of soda crystals which have been supplied as chemically pure for analytical purposes have been found to contain an appreciable quantity of arsenic. There may well remain, therefore, some anxiety as to the destiny of impure phosphate of soda which was consigned before the fact of its arsenical impurity was known. The apprehension of mischief arising increases in intensity when we have regard to the fact that phosphate of soda is employed as an ingredient in a popular effervescing drink. The use of this drug in this indiscriminate way is much to be deprecated, and had it not been for the fact that phosphate of soda had been prescribed for a person under medical care it is quite probable that the presence of arsenic in phosphate of soda would still have remained undiscovered. It is not at all improbable that many persons addicted to this medicated beverage have been innocently poisoning themselves. The Pharmacopœia says nothing about arsenic as an impurity of phosphate of soda, although in the method of preparation described sulphuric acid is, of course, mentioned and under sulphuric acid a test is given for the presence of arsenical impurity. It would appear that the importance of the omission of any test for arsenic in phosphate of soda in the British Pharmacopœia was recognised previously to this prosecution, for a few days ago we received a specimen of the salt which is perfectly free from arsenic from Messrs. May and Baker of Garden Wharf, Church-road, Battersea, who have a stock of this article which they state they can supply without delay. It is a pity, we think, that if, as these druggists state, they knew of the important impurity they did not give greater and earlier publicity to the fact. In future, however, confidence may be felt that sodium phosphate will be supplied free from arsenic, for Mr. Plowden's ruling decides that a prosecution may properly be instituted under the Sale of Food and Drugs Act. Fines and costs were accordingly ordered to be paid by the defendants. The defendant druggists, of course, are entitled to the sympathy of the trade, but their annoyance should be considerably allayed by the fact that the publication of these proceedings has done an excellent service in the interests of public health, for vigorous steps are being taken both by wholesale and retail firms to provide in future nothing but absolutely arsenic-free phosphate of soda.

LEAD AND PHOSPHORUS POISONING.

IT is evident from the reply given by the Home Secretary to the questions raised by Sir Charles Dilke relating to the prevalence of lead-poisoning in the Potteries that no very substantial improvement has been effected amongst the work-people engaged in this dangerous trade. It is true that some diminution in the number of cases of lead-poisoning followed closely on the establishment of the new rules in 1898. According to the statement of Sir Charles Dilke, however, the diminution in 1899 was because the doctors now "suspended" from work people who had developed mild forms of lead-poisoning. This seems to us to imply an inadequate system of medical examination and the suggestion that a woman inspector should be appointed was made, a step which, however, Sir Matthew White Ridley declined to take. He admitted that lead-poisoning was a fearful thing in the Potteries and he promised that the Home Office would do everything that they possibly could to secure that the industry should be carried on in a manner as little harmful as possible to those engaged in it. The department hoped shortly to publish a new code of rules in accordance with the recommendations of Dr. Oliver and Dr. Thorpe, but there was to be no absolute prohibition of the use of raw lead. The Home Secretary did not think that much more could be done in regard to phosphorus, but he hoped that the cases of necrosis would continue to diminish as they had done in the past, one case only being reported during the past six months. Further, as a result of the public attention devoted to the subject, one large firm had abandoned the use of yellow phosphorus. The only really satisfactory issue of both these problems will be when it is found to be quite practicable to dispense altogether with both raw lead and yellow phosphorus.

THE SOUTH AFRICAN COMMISSION.

THE appointment of the two additional members to act upon the commission proceeding to South Africa to inquire into and report upon the arrangements for the care and treatment of the sick and wounded at the seat

of war has now been definitely settled and announced. The names of the new members are Sir David Richmond, ex-Lord Mayor of Glasgow, and Mr. Harrison, the general manager of the London and North-Western Railway. We do not think that a better choice could have been made. They will bring to the inquiry all the necessary business qualifications. We are especially glad that the traffic manager of a big line of railway has been selected, for we have strongly advocated this course, but we are of opinion that the constitution of the commission might have been further modified with advantage.

THE CONSTITUTION OF THE BRITISH MEDICAL ASSOCIATION.

AN extraordinary general meeting of the British Medical Association was held on July 18th at Exeter Hall to consider new articles of association providing, to sum up briefly, that the administration of the Association should remain in the hands of the Council. There was a fairly large attendance. The adoption of the new articles was proposed by Mr. Ward Cousins (President of the Association), supported by Dr. J. R. Thomson of Bournemouth (President of the Council). Neither of these gentlemen obtained the ear of the meeting. Mr. Victor Horsley spoke against the new articles, and after some words from Dr. F. M. Pope of Leicester and Dr. Lorimer Hart the business of the meeting, terminated by the rejection of the Council's proposals for the adoption of the new articles.

AMONG the victims of the Peking massacre, concerning the occurrence of which there can no longer be more than the slenderest doubt, are three members of the medical profession, Dr. G. E. Morrison, Dr. Wordsworth Poole, and Miss Lillie E. V. Saville. Dr. Morrison, who was only 38 years of age, was an Australian by birth and received his medical education at Melbourne and Edinburgh. He was already a famous traveller and was the *Times* correspondent at Peking. Dr. Wordsworth Poole, who was also a young man, received his medical education at Cambridge, and had been principal medical officer at Zomba, Lake Nyassa, British Central Africa. He was staying at Peking with his wife. Miss Lillie Saville, M.D. Brux., received her medical education at the London School of Medicine for Women and had been a medical missionary in Peking for the past five years.

THE annual meeting of the subscribers to, and others interested in, the Hospital for Epilepsy and Paralysis and other Diseases of the Nervous System, Portland-terrace, Regent's-park, will be held at the hospital (near St. John's Wood-road station), on Wednesday, July 25th, at 3 P.M., when the Right Hon. the Earl of Hardwicke, President, will be in the chair.

H.R.H. THE PRINCESS OF WALES paid a visit to the London Hospital on Friday, July 13th, accompanied by her daughter Princess Victoria. After inspecting the extensions in the hospital, especially the new room for the light treatment of lupus, they had tea with the nurses.

AT the forthcoming International Medical Congress in Paris Dr. the Hon. Alan Herbert, physician to the Hertford British Hospital, Paris, will be presented with an address by the former and present medical officers of the hospital, numbering 20.

SIR HECTOR C. CAMERON, M.D. Glasg., President of the Faculty of Physicians and Surgeons of Glasgow, received his knighthood at the hands of the Queen at Windsor Castle on June 30th, as did also Sir George Hare Philipson, M.D. Cantab.

A TELEGRAM from Sir H. A. Blake, Governor of Hong-Kong, received at the Colonial Office on July 16th, stated that during the previous week 57 fresh cases of plague had occurred with 58 deaths.

DR. MARC ARMAND RUFFER, President of the Sanitary Maritime and Quarantine Board of Egypt, has received from His Majesty the Sultan of Turkey the Order and Insignia of the Medjidieh of the Second Class.

THE dignity of a Knighthood of the United Kingdom has been conferred upon the Hon. William Bisset Berry, M.D. Aberd., Q.C., Speaker of the House of Assembly of the Colony of the Cape of Good Hope.

MR. JOHN H. MORGAN, on resigning the position of senior surgeon to the Hospital for Sick Children, Great Ormond-street, has been unanimously elected consulting surgeon.

THE WAR IN SOUTH AFRICA.

OUR morning papers are full of wars and the rumours of wars at the present time and this country is realising the responsibilities of empire. The deplorable events which have occurred in China and the extent and formidable nature of the task which has to be undertaken in that country have tended to withdraw public attention for the time being from the war in South Africa, and to minimise and nearly exclude from consideration what under other circumstances would be regarded as most exciting events connected with the little campaign on the West Coast of Africa. Confining our attention, however, to South Africa we may say that the news from that seat of war was at the end of last week of a disappointing character. Although it cannot have any effect on the ultimate issue or undo what has been already accomplished there, the intelligence that the Boers had again carried out one of their successful surprises and had defeated a small British force and captured a number of British troops and taken some guns was very unpleasant reading. That the occurrence took place at this stage of the war and almost, as it were, under Lord Roberts's eyes, took the public by surprise and did not tend to decrease the sense of disappointment with which the news was received. If such occurrences have almost ceased to be regarded as surprising on account of their frequency, still it cannot be said that they have brought about that equanimity which might be expected to come from our being accustomed to them. De Wet and Botha are still active and enterprising and show remarkable skill in raiding, retreating, and eluding capture. Their tactics as guerilla chiefs seem remarkably good. Spies and disaffected persons no doubt abound in our camps and furnish them with early and reliable information as to all our movements.

Though there is not much news to hand at the moment of writing what there is is satisfactory. There is a great and increasing amount of activity on the part of the British forces. So far as we can gather the British troops, notwithstanding their hardships and fatiguing marches, are in excellent fettle and their health, as a whole, is good. There is, of course, a large amount of enteric fever, but the prevalence of the disease is believed to be diminishing and it is hoped that, what with the cold weather and a decreasing amount of fatigue and exposure on the part of the troops, it will continue to diminish.

We would call attention to the remarks of our Special Correspondent writing from Bloemfontein. As we have repeatedly urged the great difficulty in modern warfare—especially in a country like South Africa—is transport. We have always contended that a certain amount of transport should be independently set apart for the medical requirements of war and that it should never be diverted from this object except at the express order of the general in command and, where possible, in writing. This obtains in the American army, and there is or was, we believe, an Act of Congress to that effect.

The total losses reported from the beginning of the war up to the end of last week (exclusive of sick and wounded men now in British hospitals in South Africa) amount to 32,524. These are made up as follows according to the latest return issued from the War Office —

—	Officers.	Non-commissioned officers and men.
Killed in action	261	2,434
Died from wounds	72	637
Missing and prisoners (excluding those who have been recovered)	61	1,900
Prisoners who have died in captivity	1	84
Died from disease	139	4,563
Accidental deaths	—	70
Sent home as invalids	965	21,337
Total	1499	31,025

THE IMPERIAL YEOMANRY HOSPITAL.

BY ALFRED D. FRIPP, M.S., F.R.C.S.

No. 3 Hospital Train returned on June 21st from Mafeking bringing to us the whole of the sick and wounded who had accumulated there, and as that was the third train-load we had received in six days we have had a busy week. In the last train-load there was another poor fellow—I think I mentioned to you some time ago that we had one similar unfortunate—who had lost both his eyes, and in the hospital at the present time there is also a man who only missed a similar accident by a quarter of an inch. The bridge of his nose was blown away by a transversely crossing shell, but most fortunately neither of his eyes was damaged. Both of the blind men show a most splendid spirit and pluck in their fearful adversity.

Lord Chesham, who has left again for the front, tells us that our field hospital was captured by Christian De Wet at Rhenoster and that it was made to move its camp to a neighbouring valley and told to lie low there until he could supply it with wounded. De Wet's agility and daring, which have resulted in so many surprises to our forces of late, enabled him, as you know, to swoop down upon the Derbyshire Militia just as they were detraining, and he kept his word to our field hospital by sending to them the 70 or 80 Derbyshires who were wounded before the rest capitulated. This commander is a thorn in the side of those of our troops who are placed along the railway to keep the lines of communication open, and one cannot help admiring his skilful and brave movements. We are told that he visited Lord Methuen and said that he would like to stop fighting, as he knew "the game was up," but that he could not do so until he received instructions.

I am glad to say that our invalid staff are all going on well. Greenfield and Parker are both convalescent and out of danger, and none of the other surgeons who have been "warded" have shown any symptoms of enteric fever. One-third of our orderlies are still on the sick list, but none of them are dangerously ill. Several of them have influenza—indeed, there is quite an epidemic of it—and the sudden invasion, by this fever, of patients whose temperature charts are being anxiously watched on account of the other illnesses often gives rise to anxiety. It is no uncommon thing for patients who have come down with wounds to develop enteric fever some days after admission, and similarly a few patients who have come in with other complaints have developed scarlet fever, for which we had to establish several weeks ago an isolation camp. One of our surgeons' dressers, Blathwayt, is among the recent recruits and it is a dull look-out for him to be condemned to six weeks' or seven weeks' seclusion "across the line." Now that influenza has made its appearance, imported from England we suppose, we have been provided with a third illness which has to be considered in investigating the cause of any sudden rise of temperature in a patient. The presence of scarlet fever in the camp has been a very great nuisance, for it has entailed a large increase in the heavy amount of disinfection which is called for in a camp of this size, but by means of stringent regulations and perpetually looking out for the earliest signs of the disease we have been able to limit it to a very few cases indeed. There are 16 cases in the isolation camp at the present time and there have never been more, but as five of them, in addition to Blathwayt, are members of the staff, and as their absence from duty is necessarily for the long period that I have mentioned, it is a serious blow from an administrative point of view.

We are all very much disappointed that the war does not crumple up more rapidly. We feel as if we had been away from home for two or three years. Somebody was suggesting the other day that instead of our going home when this war is over we should have to go on and establish a hospital in China, but I sincerely hope that this will not be the case, for we all feel that we have had quite enough of war for the present.

We have done all we possibly can to give an occasional day off to some of the less strong of the sisters, but the very fact that they have been so hard at work as to need it badly, has made it very difficult to arrange. One or two of them have changed places with a sister on a hospital train for a few days at a time, and this has secured them, if not a holiday, at least a change of work and a novel experience. Now, however, the 10 extra nursing sisters, whom the committee kindly despatched directly they received my application for them, have arrived, and they will be invaluable. Already they have enabled one or two of the sisters who have been working here without a break of any kind for three months to have "a day off." Many other sisters travelled with our 10 sisters from England, some for the hospital at Wynberg, who told ours that they were very jealous of their luck in being sent so much nearer to the front. It is very striking how deeply this wish to go to the front is embedded in everybody—until they have been there. The staff of each of the hospitals that I have come across is anxious to be pushed further forward under some hazy sort of impression that they want to be as near to the hub of the universe as possible. They have not a notion how their efforts to do good would be discounted at every turn by the great difficulty, or in some cases the impossibility, of getting the essentials for good work. The story told by those people coming down from the front is very different. Medical officers one after the other come here and say, "How fortunate your hospital is to have this lovely site and opportunities for quiet and good work unimpaired by the contamination of air and water and soil and the frightful difficulties of transport which hamper everybody up north." That exactly tallies with the experience which I derived from my journey up to Kroonstad a month ago. The difficulty of transport north of Bloemfontein is really so great that it dominates the whole situation. Colonel W. H. MacNamara, R.A.M.C., the principal medical officer of the lines of communication, was visiting us two or three days ago and told me that it has not yet been possible to get up to Kroonstad more than one-quarter of the hospitals, which are waiting packed in trucks, and should have been delivered there four weeks ago. Hospitals are, of course, useless when packed in trucks, and what is wanted to render them useful is not so much more hospitals packed in trucks as more steam engines and more water-supply along the line and less interruption of railway traffic at the vulnerable points of the line, such as bridges, &c. The hospital trains can get up and down all right; they always have efficient engines and now that many of the hospitals have been moved up-country to Norval's Pont, Springfontein, and Bloemfontein, and so on from Cape Town, these trains are more than equal to the demands made upon them to keep us well supplied with patients.

If this hospital could be picked up bodily and dropped down again without any interference with its work—that is an important point—at Norval's Pont it would not be a bad thing, for it would save about eight hours on the run of each hospital train and would place us in a region where eggs, milk, and butter are plentiful and good. Norval's Pont, however, was not in British hands when we pitched our camp, and there is nowhere else in South Africa that from our point of view is more suitable than Deelfontein. The weather now, though cold except when the sun is shining, is on the whole quite lovely—day after day of cloudless sky—and everything goes well with us.

I think that, knowing what you do of the amount of trouble that was expended in London on the thinking out of the equipment of this hospital, and knowing what I have written of the complete success which has crowned that work—for really we have everything that we want and nothing that we do not want—you will be amused to hear that somebody has been amusing himself by trying to make out that we came out unequipped for our work. The only instance that he can cite in support of this charge is that we had to borrow in our earliest days a few blankets. Plenty of blankets were sent by the committee from home and they got here by the time we were fit to declare a section of our hospital "ready," but before we were so ready Surgeon General W. D. Wilson, P.M.O., urgently requested us to place a few beds at his disposal at the earliest

possible date, and it was in order to comply with the request and so to help by every means in our power, even though our equipment was not yet complete, that we had to ask for a loan of some blankets—a loan that we have more than repaid already by the odds and ends of equipment which we have from time to time been called upon to contribute to others whose stock was exhausted or lost. In this way we have been able to lend a hand to many surgeons with battalions of Yeomanry as they went past us, and Lord Chesham only this week took back with him to his battalion at the front a supply of warm underclothing, Balaclava helmets, and so on, which he said were urgently needed, and which we had been placed in the position to afford by the kindness and energy of friends at home. Many people have been extremely generous in the way they have responded to the appeal in one of these letters some weeks ago for tobacco and sweets. Quite a large number of the officers here do not smoke, but almost all the men do, and it takes my wife between five and six hours every day, Sundays included, to accomplish her round of the hospital now that there are from 700 to 800 patients. She tells me that each week she distributes about 70 lb. of cake tobacco, 40 lb. of cut or packet tobacco, and 7000 cigarettes—that or more, besides many other "comforts." Idiosyncrasies and longings come out strong in such a large and varied collection of men. One poor fellow who died from cancer last Saturday had a special craving, sometimes very weird, almost every day he saw her. On the morning of the day he died he enjoyed some Madeira cake and a glass of port wine and soda-water. The day before nothing would content him but a dish of potatoes. For a few days before that he practically lived on oranges, which luckily we are able to get here now. One day he suddenly asked her for a stick of "Spanish." Liquorice was what he meant, so we wired to Cape Town and got some up in time for him thoroughly to enjoy munching a great stick and having some more dissolved in water so that everything he ate or drank for a day or two was flavoured with it.

Deelfontein, June 25th.

(FROM OUR SPECIAL CORRESPONDENT LATELY AT THE BASE.)

We are gradually getting the best of the epidemic, but still have a number of cases sent from outlying stations. At present there are roughly 1000 cases under treatment here in the various civil and military hospitals, but I trust that as the cold weather advances these numbers will materially decrease. No. 2 General Hospital went up to Pretoria yesterday and will be followed by the Irish Hospital in a few days. From all accounts there is not a great amount of sickness in Pretoria or Johannesburg, and it is at present doubtful, considering the very excellent hospitals that exist in these two towns whether it will be necessary to order up more general hospitals. One point has struck me during the war, and that is how well the enteric fever cases have done whilst under canvas; in fact, I think those treated in tents have certainly made more rapid recoveries than those treated in buildings. The cold is intense here mornings and evenings. There is a white frost on most days, but the sun has great power during the day, and given the absence of rain the climate at present ought to do wonders for the convalescents. I am glad to bear testimony to the excellent work performed by the men of the St. John Ambulance Corps who are out here; they have amply justified the good things said about them and they do their duty in an uncomplaining and willing manner and have been of the greatest assistance to us in our manifold duties. The lesson to be learnt for our next big campaign will, I trust, be impressed on the military authorities and the Treasury, and the system of starving the Royal Army Medical Corps during peace time with its attendant disadvantages rectified. The vital subject of transport, too, will require to be well looked into, as half of our difficulties at the present time are the result of deficient means of transporting the sick and wounded. In my own opinion, it is an absolute necessity in future wars that the medical transport should be in our own hands and should not be diverted from the purposes it is intended for. I hear to-day that there is a possibility of demands being made on our already impoverished ranks for duty at the Gold Coast and that volunteers for that work are likely to be called for. It is to be fervently hoped that the business will be of short duration, as the climate of West Africa can hardly be called salubrious, and the casualties are likely to be numerous at this season of the year.

Bloemfontein, June 23rd.

THE UNIVERSAL EXHIBITION AT PARIS.

(FROM OUR SPECIAL CORRESPONDENT.)

The Four Medical Congresses: Press Arrangements and Festivities.

HENCEFORTH the medical press will not be able to complain of indifference on the part of the powers that be. Even the newly elected Municipal Council of Paris, which has shown a disposition to slight and to neglect what its predecessors had organised, is making an exception in favour of the International Congress of the Medical Press and has expressed the desire to give this congress an official reception at the Town Hall on Thursday, July 26th. As with the Guildhall or the Mansion House in London, so with the Hotel de Ville in Paris, foreigners are generally pleased to have an opportunity of visiting this historic municipal palace. But whatever lukewarmness the Nationalist majority of the Paris municipality may show, the Government is leaving no stone unturned to render the Exhibition and all the congresses connected therewith successful. Thus M. Millerand, Minister of Commerce, has promised to assist at the opening ceremony of the Medical Press Congress. This will take place at the Press Pavilion in the Exhibition grounds on Thursday afternoon, July 26th. On the following Saturday evening there is to be a banquet and entertainment in the picturesque reproduction of Old Paris which is one of the attractions of the Exhibition and it is anticipated that M. Waldeck Rousseau, the Prime Minister, will be present. On Friday evening, the 27th, there will be private receptions, and on Sunday, the 29th, excursions to Chantilly and Versailles will be organised. On Monday, the 30th, the Minister of the Interior will give a reception to the members of congresses present in Paris, and on Sunday, August 5th, the President of the Republic will give a garden party to the members of the Medical Press Congress and of the International Medical Congress which will then have assembled in Paris. Indeed, from July 23rd up to August 17th, may be qualified as devoted to medical men. It is unfortunate that the Medical Press Congress should meet during the last three days of the International Congress on Medical Ethics. With the exception of the opening ceremonies both congresses meet close together at the Faculty of Medicine and it is thought that the members of the medical press who are attending both congresses will be able to flit from one to the other according to the interest of the proceedings. This, in my opinion, is a serious mistake. It is the duty of the representatives of the medical press not to neglect questions affecting medical ethics, yet they are expected to meet at a congress of their own while the Congress on Medical Ethics is proceeding. But it is said that during the four days between July 28th when the Congress on Medical Ethics concludes and August 2nd when the General Medical Congress begins the members of the medical press will be usefully employed in organising the reporting of the Medical Congress. In view of such organisation a meeting of all the members of the medical press has been convoked at the Press Bureau of the Faculty of Medicine for Wednesday August 1st. But there has already been some organisation in this respect. For instance, all members who intend to read papers at the Medical Congress are requested to write in their own language a summary of 50 lines in length and to bring with them 200 printed copies of the same. The Press Bureau of the Faculty of Medicine, will then see that these slips are properly distributed and thus the authors of the papers, &c., will be relieved from all further trouble. Those members, however, who have neglected to do this will find at the Press Bureau an agency ready to have the 200 copies printed for them, and the cost will only amount to eight francs. This having been done, and as the press representatives are not convoked before the Wednesday, I cannot understand why the Medical Press Congress does not meet on the Monday and Tuesday instead of meeting at the end of the previous week when the Congress on Medical Ethics will also be holding its sittings.

Presidents of the Medical Press Congress.—Where to Put Up.

It is not necessary to describe anew the origin, object, and organisation of the International Congress of the Medical Press. The details will be found in my letter published in THE LANCET on May 5th (p. 1324). But I

should now add that Professor Virchow has taken the greatest interest in this congress, has promised to attend, and will preside over the sitting held on July 28th. Professor Baccelli of Genoa will preside on Friday afternoon and Professor Cornil will act as president for the French language Even at this, the eleventh hour, any member of the medical press will be welcome on payment of his entrance fee of £1 to the general secretary of the Congress, Dr. R. Blondel, 8, rue de Castellane, Paris. The temporary receipt given should be exchanged at any time on or after July 20th, at the offices of the French Association of the Medical Press, 93, Boulevard Saint Germain. These offices are not far from the Faculty of Medicine, and, indeed, it must be borne in mind that the Latin Quarter is the centre for all the four medical congresses. The sections will meet in the lecture halls of the Faculty of Medicine, of the Sorbonne, and of the great schools that have given to this quarter its name. Therefore, not only is there no necessity for the members of these congresses to put up in the expensive West-end of Paris or anywhere near to the Exhibition, but it would be inconvenient to do so. Rooms had better be sought on the south side of the river and as near to the lower part of the Boulevard St. Michel as possible. Excepting to attend one or two of the opening ceremonies or a banquet the members of the four medical congresses will have no occasion to go anywhere near the Exhibition, or the exclusive cosmopolitan part of Paris which has the Madeleine for its centre. Their work will be done in the University building, and therefore it will be more convenient, and many will find it more pleasant, to live in the University quarter.

The Opening Papers of the Medical Press Congress.

The two principal questions to be discussed at the International Congress of the Medical Press are the proposal to form an international association of the medical press, and, secondly, all that relates to the copyright of medical literary work. On the first of these questions Professor Posner of Berlin, Dr. Laborde of Paris, and Dr. Rubino of Naples have prepared reports. These papers are now in the press and will be printed in time for the opening of the Congress; but as I shall then have so much to say about the Congress on medical ethics, which will have held the greater part of its sittings, I had better profit by the present opportunity to give some account of these papers. Professor Posner commences by lamenting the present recrudescence of nationalism and individualism, each nation and each person seeking their own advancement and fiercely competing against their neighbours. But he claims that the ancient principle of professional confraternity has nevertheless survived among medical men, and he trusts that it may in time replace entirely the spirit of rivalry and competition. Yet there is no denying that the profession is in danger of being absorbed in the general current. It is to be hoped that the congress will inspire its members with a higher ideal than that of each striving solely for his individual advancement. As to-day the printed word is the greatest power extant for good or for evil, the medical press should strive not merely to spread scientific knowledge, but to study and defend the higher ethical interests of the profession. The learned professor then goes on to say:—"The conviction that this task can be more easily accomplished by the coöperation of all the forces than by mere individual efforts was first realised in France. The association of the medical press, founded in France, has become a prototype for analogous tendencies in other countries. The medical press of Germany and of Austria, which I have here the honour to represent, have followed the French example. If we examine the work of the medical press associations of Germany and Austria we can already congratulate these two bodies upon having succeeded in solving many problems submitted to them, though many of the ideal dreams on which these associations were based are not yet realised." To begin with the mere existence of such organisation has revealed a community of intellectual interests and a spirit of solidarity that had not been understood before. Friendships have been created, disputes avoided, and the better spirit engendered has been reflected in the columns of the medical journals much to the advantage of their readers. But practical advantages have ensued notably in regard to the reporting of medical congresses, though much remains to be done in this respect. Also by mutual understanding and common action the medical press could usefully influence legislation on all that relates to the public health. In this latter respect the German and Austrian associations of the medical press of those countries have barely realised the power they possess. The national organisations being thus so young and inexperienced it may well be questioned whether they are as yet strong enough to go a step further and to seek to establish an international organisation. Proceeding, Professor Posner says: "The extraordinary difficulties which the organisers of the Eleventh International Medical Congress held at Rome had to combat, and more especially those that were related to the organisation of the medical press, led my friend Marcel Baudouin and myself to elaborate a plan born out of our conversations. This plan was discussed at the banquet organised by the French medical journalists assembled at Rome." The plan was approved in spite of its difficulties and it will be the task of the present congress to elaborate the scheme. If the journalists would group themselves according to their language and then exchange their notes with those taken in other languages a much more accurate and complete review of the proceedings of international congresses could be obtained, also the work done in this collective manner would cost much less. Professor Posner then points out that as congresses depend for their success on the press, representatives of the press should have a voice in the organisation of such congresses. Such coöperation sometimes occurs, but it is not recognised as a principle and systematically regulated. Apart from the reporting of congresses there is need of an understanding as to what should be considered a legitimate quotation, the exchange of drawings or other illustrations, and the universal adoption of the same technical terms. Then something should be done to regulate the right of reply when controversies arise. But if it is necessary to go further than the mere expression of a pious wish, should there not be a representative executive power or committee the business of which it shall be to see that the rules accepted are uniformly applied? But no committee could exercise this power if it were not the representative of solid and durable organisations. Then there is the question of the relations to be established between the journalists of various nations. Professor Posner concludes by proposing that an International Association of the Medical Press shall be established having for its purpose to promote fraternal relations between the medical press of different nations, to represent and defend all common interests, to regulate the exchange of reports, newspapers, and news, and that an executive committee be elected to prepare a scheme on these lines.

The next report on this subject is by Dr. J. V. Laborde, President of the French Association of the Medical Press and editor of the *Tribune Médicale*. He commences by explaining that the whole trend of modern progress shows the necessity of bringing civilised nations closer together. Such "mutual penetration" is best assured by the press which conveys knowledge to each nation of what its neighbours have accomplished. When we consider how much the world has to benefit from the growth of biological and medical sciences, we need not insist on the necessity of facilitating the work of the medical press by which this knowledge is propagated. But, as science does not recognise political frontiers, its mouthpiece, the scientific press, should be internationally organised. This conception found public utterance at the Congress of Rome in 1894, and was eloquently expounded by Professor Posner of Berlin and Dr. Marcel Baudouin of Paris. Dr. Dobrozycki of Warsaw wanted to create, under the presidency of Dr. Laborde, a special section of the medical press at the International Medical Congresses. An international provisional committee was appointed. It met and drew up some proposals. Medical press associations were formed in Germany and Austria, but unfortunately no practical results were obtained when the International Medical Congress subsequently met at Moscow. Since then the German Association, and notably Professor Posner, has taken an active initiative, and this support has rendered the present Paris Congress possible. In this a great leader of modern science as well as of medical journalism, Professor Virchow, also lent efficient aid. Then came Dr. Selous of Philadelphia and Professor Alfredo of Naples. Dr. Laborde proceeded to give very elaborate rules for the future International Association of the Medical Press. These rules have a tendency, however, to put the cart before the horse; for instance, the members are to accept the regulations for the protection of medical literary property, other rules for the exchange of medical

journals, and the idea of publishing an international bulletin. This is going perhaps a little fast. But one proposal is very useful and practical—namely, that every medical journalist belonging to the International Association should have a card which will serve as an introduction in all countries. If the medical press organisations of each country would further take care that this card was recognised by their police, university, and hospital authorities, then a very great service would be rendered. It would take far too much space to analyse the numerous rules proposed and if they are to be adopted with any real knowledge of what is intended many days of very arduous discussion will be necessary. At the very onset a huge stumbling-block presents itself when the question is raised as to who shall be admitted as members of the association. Dr. Laborde says directors, editors, and general delegated secretaries. Are the special correspondents, the regular contributors, the writers on the staffs of the medical papers to be excluded, or are they considered as delegated secretaries, and if so, by whom delegated? Then, what is meant by directors? Are these the business and advertisement managers of papers or the proprietors of the papers? There are some so-called medical journals owned by wholesale druggists and published solely for the purpose of selling certain drugs. The motive of the association, we are told, will be the "moralisation of the profession"—a very good motive; but, in the same sentence we are informed that this end is to be obtained by protecting literary property. It is difficult to see the connexion. Is the druggist's property of an ingenious literary puff of a patent remedy to be protected by the united strength of an international association of medical journalists? No one could be more scandalised at such a suggestion than Dr. Laborde himself. Yet to avoid such contingencies the first step would be to define what constituted a medical journal and a medical journalist worthy of the name. At present and in different countries there are a good many sheets published that bear medical titles, deal with medical subjects, and yet are issued solely for the purpose of advertising the business of their proprietors. As the practice of medicine is a profession and not a trade such commercialism should be rigorously excluded. It would seem, however, as if the organisers of the Congress have failed to draw a sharp line between business and professional pursuits. In any case one of the papers which is to form a basis of discussion has for its author Monsieur F. Alcan, the Paris publisher, and surely publishing is a business and not a profession. Monsieur Alcan has written an interesting and appropriate paper. He is doubtless animated with the very best intentions, but he is neither a medical man nor a professional journalist. His paper deals with the reproduction of illustrations which, with existing photographic processes, is done on a very large scale and without the authors and owners of such illustrations being even aware that they have been reproduced. Then M. Alcan immediately speaks as a publisher might be expected to speak. He says that if the author of a medical treatise asks his publisher to send an artist or a photographer to his hospital or laboratory the drawing or photograph then made belongs undoubtedly to the publisher. But if the author supplies to the publisher a drawing or photograph the publisher is only the proprietor of the reproduction of the same. The author can give the same designs to some one else who may in his turn reproduce them. In both cases it should be the rule, says M. Alcan, to apply to the original publisher who should be willing to sell reproductions of the blocks for about half the original cost. The publisher would make a small profit and yet the purchaser would have to pay less than if he resorted to a photographic process. Then there is the question whether a publisher has the right to employ a design for other than the publication for which it was originally destined. Here M. Alcan speaks as a publisher and claims the right to do what he chooses with such blocks; but what would be the position of some eminent medical professor if some of the reproductions of his anatomical or other drawings fell into evil hands and were utilised to illustrate some quack or pornographic publication? It is most desirable that publishers should meet authors and discuss amicably their mutual interests, but to jumble both up together in one single congress can only lead to confusion. Each side must separately formulate their desiderata, then and then only may they meet to effect a common understanding or compromise. M. Alcan goes on to explain that in France it is not yet settled whether photographs come under the laws affecting literary and artistic property or those governing industrial property. With regard to portraits the photographer may give the publisher the right of reproducing the portrait if the person photographed consents. The publisher may have to pay for this permission. On the other hand, the person photographed may give his photograph to anyone else and authorise the latter to reproduce it. Thus the publisher's copyright becomes valueless. Doubtless this is important from the publisher's point of view, but it is less certain that eminent medical celebrities when giving their photographs to some friend or relative will take care first to obtain a pledge that the portrait shall never in any way be reproduced.

On this question of copyright there is another and lengthy report by M. de Maurans, editor of the *Semaine Médicale* and by two eminent barristers well known for their special knowledge of the subject—namely, M. M. Pouillet and M. G. Rocher. The author of a medical book has the same rights, they remark, as the author of a novel or any other book; but what is the position of the author of an idea or a discovery and of a clinical or other lecture delivered concerning the same? They continue: "The professor must give all his science to his pupils. The latter may take notes, even shorthand notes, learn what they have heard off by heart, and deduce from it the utmost possible personal instruction; but their rights go no farther than this. They cannot repeat the lecture or publish it. The professor's lecture is like an open book: the pupils may learn from it but must not attempt to make a pecuniary profit out of it." This principle was established by a verdict rendered in a Paris court on August 27th, 1828, and confirmed by another verdict on March 2nd, 1841. For the defence it was urged that as the State paid the professors their lectures became public property. The answer was that the State paid the professors to teach and not to provide the material for a book. In conformity with this judgment the reporters maintain that medical journals have not the right to reproduce clinical, university, or hospital lectures unless authorised to do so by the lecturer. Further, in giving such authorisation the lecturer should have the right to impose any conditions he may choose. This condition of affairs, I should imagine, will not be unanimously approved. The natural eagerness to create and to protect property should not efface from sight the fact that what is done publicly should be liable to public criticism; and how can lectures be criticised if they cannot be quoted. But it might with justice be urged that lecturers should be offered an opportunity of correcting the proofs of the reports of what they had said, and that as a matter of courtesy a copy of the paper in which they are mentioned might be presented to them. The reporters conclude by a humorous warning to medical authors and lecturers to be careful not so to describe their cases as to enable the personality of their patients to be recognised. The novelist Charette, to avoid trouble of this description, declared that he had selected for his heroes the names of bankrupts or of criminals who had been guillotined. But the dead leave relations who are apt to take offence. Thus a few years ago the author of a medical work on degeneration and criminality was prosecuted because some of his cases were recognised and one of them was precisely that of a man who had been guillotined. A descendant of this culprit went to law on the subject, and the tribunal ordered that the incriminating passage should be expunged from the book.

Dr. Marcel Baudouin has a paper on the Property of the Idea and the Form of the Idea in Scientific Journalism. Dr. Baudouin is Director of the International Institute of Scientific Bibliography and member of the Superior Commission of the Press at the Exhibition of 1900. He argues that an idea is a property and should be protected as such. But as yet the law has only attempted to protect the materialisation of ideas. For this it would be necessary to have some method of registering, nationally and internationally, scientific ideas. The International Institute of Bibliography, which registers day by day the intellectual productions of the entire world, might serve as a basis for such an organisation. Even now we are able to say who was the first person to give a written or drawn expression of an idea and to find this out promptly by the system of registering now adopted—*Répertoires idéologiques chiffrés*. By these methods of registering it would not be so difficult to ascertain what really does constitute a new idea. Dealing at great length with the existing copyright laws, Dr. Baudouin does not agree completely with the papers of

M. Pouillet, M. Rochet, and M. Alcan. He is not in favour of severe checks to prevent the reproduction of lectures, newspaper articles, speeches, &c., but he is anxious to protect a genuinely new idea. To check the reproduction of scientific drawings is to check the spread of education, excepting when such check is necessary so as to prevent disloyal competition. What needs special protection is not so much the literary construction of phrases to explain an idea or an artistic illustration, but the idea itself, however roughly expressed.

Several papers will be read on the constitution of the medical press in different countries. M. Lévy, editor of the *Revue Illustrée de Polytechnique Médicale*, will read a paper on the use of a pseudonym preceded by the term "Dr." in the writing of "puffs." M. de Maurcous has a paper on the affiliation of associations of the general or political press. There are to be papers on medical journals that are gratuitously distributed and have no *bonâ-fide* sale and on gratuitous publicity and its dangers. Dr. Blondel has a paper on the reports published of meetings of learned societies and the effects of such publicity on special reviews or magazines. M. Jayle, sub-editor of the *Presse Médicale*, will deal with personal controversies and the right of reply. Professor Bossi of Genoa will speak on the relation between medical journals that deal with sanitary questions and the general press. Professor Richet, editor of the *Revue Scientifique*, will treat the question of agreeing to employ an international decimal dictionary for the translation of figures, measures, &c., and another paper suggests a common agreement as to the spelling to be adopted in translating Slav names into the Latin alphabet; then there are some technical papers on the binding of journals or the wrapper problem, the reproduction of coloured illustrations, and the use of the phonograph and the kinematograph in reporting.

So far, therefore, as technicalities are concerned there is enough and more than enough to talk about, but it is in respect to organisation, the principle and basis of organisation, that the programme seems weak. However, this is but a first attempt. A great step forward will have been accomplished if a sort of professional feeling is engendered between medical journalists leading to the ultimate adoption of one ethical code for their moral guidance.

Paris, July 16th.

BRITISH MEDICAL GUILDS AND THE INTERNATIONAL CONGRESS ON MEDICAL ETHICS.

ON Monday, July 23rd, the First International Congress on Medical Ethics or Deontology will hold its first sitting at the Press Pavilion on the Exhibition grounds and will meet for the rest of the week at the Paris Faculty of Medicine. We regret to hear that the British medical unions, guilds, and kindred organisations have not responded as fully to the widely distributed invitation as we had every reason to expect. The object and utility of an international congress dealing with the economic interests and position of the medical profession seem to have been better appreciated on the continent. Of course, the French members will be the most numerous as the Congress meets in Paris. The nation which so far and after France sends the greatest number of members is Italy. Then come Switzerland, Germany, the United States of America, Belgium, Spain, Russia, Denmark, and Great Britain is only ninth on the list, followed closely by Austria, Roumania, and Holland. The nations sending but three or four delegates are Portugal, Egypt, Turkey, Greece, Brazil, Venezuela, Sweden, Norway, and Canada, while Uruguay, Peru, Cuba, Japan, and Mexico have each one delegate only. Counting Canada this makes 27 different countries that will be represented and the list is not yet complete. Considering the importance of Great Britain as a nation, the political freedom to form organisations which we have long enjoyed, and our experience in the art of self-government, the representatives from Great Britain should have been more numerous and have taken a more active part in the preparation of papers or reports. Some English papers, as our readers are aware, have been announced, but these are not as numerous as might reasonably have been expected. Still, there is yet time to augment our list of members, and in any case a greater show of sympathy might be made. Of course, we can well understand that the medical unions that exist are of but recent creation and do not in most cases dispose of sufficient funds to pay the expenses of sending special representatives to Paris. But there are many members of these medical organisations who propose to visit the Paris Exhibition at their own expense, and they might have arranged to do so at the time when the Congress was being held so as to put in an appearance on behalf of their societies. Those practitioners who do not belong to any such organisations will also be welcome if they sympathise with the object of the Congress, and we hold at their disposal circulars of invitation if they will apply to us for them. The movement—namely, the forming of medical unions for the defence of the economical and ethical interests of the medical profession—is now so widespread that a proposal to establish an international federation of such unions has already been forwarded to the organisers of the Congress from several different quarters. It is also proposed that these congresses should be held at regular intervals and invitations for the next Congress on Medical Ethics have already been received from Brussels, Liège, Rome, Vienna, and St. Petersburg. Further, and so that the work of the Congress should be widely known, the General Association of the French Medical Press has made arrangements to act as secretary or agent of all the members of the Congress. The Press Bureau of this association will undertake to have 150 copies made of summaries of speeches, to pay the postage, and forward these to 150 different papers for 8*s.* if they do not exceed 15 lines and 15*s.* if they amount to 50 or more lines. The charge made, it will be seen, barely covers postage and stationery; it is a work of propaganda, not a commercial undertaking.

Finally, we would urge that those medical unions, guilds, &c., which are absolutely unable to secure the presence of representatives might, nevertheless, authorise their president or secretary to enrol himself as a member of the Congress. This implies the filling up of the form of application attached to the circulars of invitation and the forwarding of the subscription of 12*s.* to M. Masson, treasurer, 120, Boulevard St. Germain. This might be followed by a letter of apology for non-attendance, an expression of approval, and any statement which it might be thought useful to make. The name of the society would then appear in all the documents and in due course the society would receive the report of the proceedings, which will be a volume containing much useful information. For the modest outlay of 12*s.* the various societies that are not sending delegates would thus, nevertheless, contribute materially and morally to ensure the success of their colleagues of all nations who are struggling to promote the same cause that they are defending in England.

The programme and printed reports are now ready, and these, together with the card of membership which gives the right of free admittance to the Exhibition and to the sittings of the Congress, can be obtained on applying at the Masson Library, 120, Boulevard St. Germain. We are also asked to notify that the General Secretary of the Congress has changed his address and communications for him should now be addressed to Dr. Jules Glover, 23, rue de la Bienfaisance, Paris.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

QUARTERLY MEETING.

A QUARTERLY meeting of the Council was held on July 12th, the President, Sir William Mac Cormac, Bart., K.C.V.O., being in the chair.

The PRESIDENT reported the re-election as members of the Council of Mr. John Tweedy and Mr. Alfred Cooper and the election of Mr. Ward Cousins and Mr. Alfred Pearce Gould.

Mr. Tweedy, Mr. Cooper, Mr. Ward Cousins, and Mr. Pearce Gould were introduced, made declarations in the terms of the oath as prescribed by the Charter of 1800, and took their seats as Members of the Council.

It was resolved that the salary of the conservator of the museum should be increased.

It was resolved to print 250 additional copies of the first

volume of the second edition of the "Physiological Catalogue."

It was resolved that the deputation to H.R.H. the Prince of Wales should consist of the President, the Vice-President, Mr. Bryant, as senior member of the Council, the Secretary, and the Assistant Secretary.

The Council then proceeded to the election of the Most Hon. the Marquess of Salisbury, K.G., and the Right Hon. the Earl of Rosebery, K.G., K.T., as Honorary Fellows of the College.

The alterations in the by-laws relating to the Fellowship were signed by the members of the Council who were present and they were sent to the Secretary of State for Home Affairs for approval.

The PRESIDENT reported that on the day appointed for a meeting of Fellows under Section XXIII. of the regulations of the Council the required quorum was not obtained, 20 Fellows only, including three members of Council, having attended, and accordingly no meeting had been held.

A letter was read from Mr. THOMAS BRYANT, reporting the proceedings of the General Medical Council at their late session, and the thanks of the Council were given to Mr. Bryant for his services as the representative of the College on the General Medical Council.

A report was read from Mr. MORTON SMALE, member of the Board of Examiners in Dental Surgery, upon Dental Education in the United States of America. Mr. Morton Smale was thanked for his report, which was referred to the Dental Board.

ELECTION OF PRESIDENT AND OFFICERS.

Sir William Mac Cormac was unanimously re-elected President for the fifth time, and Mr. J. Langton and Mr. Henry Morris were appointed Vice-Presidents. Mr. Charles Stewart, Mr. Percy Furnivall, and Professor Christopher Addison were elected Hunterian Professors for the ensuing year. Dr. T. Grigor Brodie was elected Arris and Gale Lecturer and Mr. Walter Edmunds was elected Erasmus Wilson Lecturer. Mr. F. Canton was re-elected, and Mr. Storer Bennett was elected, a member of the Board of Examiners in Dental Surgery.

THE HONORARY FELLOWS.

The following three distinguished Honorary Fellows have already been made:—

H.R.H. The PRINCE OF WALES, K.G., Elected June 14th, 1900.
The Most Hon. the MARQUIS OF SALISBURY, K.G. } Elected July 12th,
The Right Hon. the EARL OF ROSEBERY, K.G., K.T. } 1900.

The following is the list of Honorary Fellows of the Royal College of Surgeons of England who will be elected on Thursday next subject to their being present to receive the diploma:—

Albert, Eduard Professor of Clinical Surgery, University of Vienna.
Ball, Charles Bent, M.D., M.Ch., Regius Professor of Surgery, University of Dublin.
Bassini, Edoardo, Professor of Clinical Surgery, Royal University of Padua.
Bennett, Edward Hallaran, M.D., M.Ch., Professor of Surgery, Trinity College, Dublin.
Berg, John Wilhelm, Professor of Surgery, Royal Caroline Institute of Medicine and Surgery, Stockholm.
Von Bergmann, S. Exc. Professor Dr. Ernst, Geh. Med. Rath, Berlin.
Bloch, Oscar, Professor of Surgery, University of Copenhagen.
Bottini, Enrico, Professor of Clinical Surgery, Royal University of Pavia.
Cameron, I. H., Professor of Clinical Surgery, University of Toronto.
Cardenal Fernandez, Dr. Salvador, Vice-President Royal Academy of Medicine and Surgery, Barcelona.
D'Antona, Antonino, Professor of Surgery, Royal University of Naples.
Durante, Francesco, Professor of Clinical Surgery, Royal University of Rome.
Von Esmarch, S. Exc. Professor Dr. Friedrich, Wirkl. Geh. Rath, Kiel.
Halsted, William Stewart, M.D., Professor of Surgery, Johns Hopkins University, Baltimore.
Hingston, Hon. Sir William Hales, M.D., LL.D., D.C.L., Professor of Clinical Surgery, University of Laval.
Jameson, Surgeon-General James, C.B., M.D., LL.D., Director-General Army Medical Service.
Keen, William Williams, M.D., LL.D., Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia.
Kocher, Theodor, Professor of Surgery, University of Bern.
König, Professor Dr. Franz, Geh. Med. Rath, Berlin.
Küster, Professor Dr. Ernst Georg Ferdinand, Geh. Med. Rath, Marburg.
Lambotte, Elie, Brussels.
Lannelongue, Odilon Marc, Professor of Surgical Pathology, Faculty of Medicine of Paris.
Leonander, Karl Gustaf, M.D., Professor of Surgery and Obstetrics, University of Upsala.
Macewen, William, M.D., LL.D., F.R.S., Regius Professor of Surgery, University of Glasgow.
MacLeod, Colonel Kenneth, M.D., LL.D., I.M.S., Professor of Clinical and Military Medicine, Army Medical School, Netley.
Nicolaysen, Jullus, Professor of Surgery, Royal University of Christiania.
Norbury, Sir Henry Frederick, K.C.B., Director-General, Medical Department of the Royal Navy.
Ollier, Leopold, Professor of Clinical Surgery, University of Lyons.
Pachoutine, Victor, President, Imperial Military Academy of Medicine, St. Petersburg.
Pozzi, Samuel, Professor, Faculty of Medicine of Paris.
Raye, Colonel Daniel Charles O'Connell, M.D., Indian Medical Service.
Roddick, Thomas G., M.D., C.M., Professor of Surgery, McGill University, Montreal.
Rubio y Gali, Federico, Member of the Royal Academy of Medicine of Madrid.
Sklifossovsky, Nicolas Wassilievitch, Director and Emeritus Professor, Imperial Clinical Institute of the Grand Duchess Helena Pavlovna, St. Petersburg.
Tillaux, Paul, Professor of Clinical Surgery, Faculty of Medicine of Paris.
Veliaminoff, Nicolas, Professor of Surgery, Imperial Military Academy of Medicine, St. Petersburg.
Warren, John Collins, M.D., Professor of Surgery, Harvard University.
Weir, Robert Fulton, M.D., Professor of Clinical Surgery, Columbia University, New York.

A deputation will attend at Marlborough House on July 24th to present the Diploma of Honorary Fellowship to H.R.H. the Prince of Wales.

The Marquis of Salisbury and the Earl of Rosebery and all the other Honorary Fellows have expressed their intention of attending the meeting to be held on July 26th, at 3 P.M., in the theatre of the University of London, Burlington-gardens, to receive their diplomas.

COMMEMORATION DINNER OF THE EPIDEMIOLOGICAL SOCIETY.

A HIGHLY successful dinner of this society was held at the Grand Hotel, Trafalgar-square, on Friday, July 13th, to commemorate the fiftieth anniversary of the foundation of the society. The President, Dr. FRANKLIN PARSONS, occupied the chair, and among the guests who accepted the hospitality of the society were Sir Joseph Fayrer, Bart., K.C.S.I., F.R.S., honorary member of the society, Sir William Broadbent, Bart., F.R.S., Sir Douglas Powell, Bart., Sir Henry Norbury, K.C.B. (Director-General of the Royal Navy Medical Department), Sir Archibald Geikie, F.R.S. (Director-General of the Geological Survey), the President of the Royal College of Physicians (Dr. W. S. Church), the Parliamentary Secretary of the Local Government Board (Mr. T. W. Russell, M.P.), the Director-General of the Army Medical Department (Surgeon-General Jameson, C.B.), the Permanent Secretary of the Local Government Board (Mr. S. B. Provis, C.B.), the Legal Adviser to the Post Office (Sir Robert Hunter), the President of the Medical Society of London (Dr. Frederick Roberts), Dr. Farquharson, M.P., Mr. Harry Farnall, C.M.G. (of the Foreign Office), Professor Macfadyen (Director of the Jenner Institute), Professor Sims Woodhead, Sir James Crichton Browne, K.C.B., F.R.S., Professor Haldane, F.R.S., Dr. Dawson Williams, Mr. Fryer (of the Board of Trade), Dr. Hector Mackenzie, Mr. W. F. Blake, L.C.C., Dr. F. J. Allan, and many others, while among the members of the society present were Dr. W. A. Bond, Mr. R. M. Bruce, Dr. G. S. Buchanan, Dr. Bulstrode (honorary secretary), Dr. F. F. Caiger, Dr. Childs, Professor Corfield, Dr. J. W. H. Eyre, Dr. Wilfred Fletcher, Dr. E. W. Goodall, Dr. Russell Harris, Dr. Bruce Low, Dr. Spencer Low, Dr. J. MacCombie, Dr. Patrick Manson, C.M.G., F.R.S., Mr. Shirley Murphy, Dr. Newsholme, Colonel Lane Notter, R.A.M.C., Mr. W. C. C. Pakes, Dr. J. Frank Payne, Dr. R. Reece, Dr. J. Robertson, Mr. W. N. Shaw, F.R.S. (Secretary of the Meteorological Council), Dr. Steegmann, Mr. Hugh Stott, Dr. R. B. R. Sweeting (treasurer of the society), Dr. J. F. J. Sykes, Dr. Theodore Thomson, and Dr. B. A. Whitelegge. Each guest was presented with a little commemoration volume giving a short history of the foundation of the society and a list of its founders, presidents, treasurers, and honorary secretaries since the foundation.

The toast of "The Queen" having been proposed by the CHAIRMAN and duly honoured by the singing of the National Anthem by an admirable quartette, Sir ARCHIBALD GEIKIE proposed "The Navy and Army

and Auxiliary Forces" which was responded to by Sir HENRY NORBURY, K.C.B., and Surgeon-General JAMESON, C.B. The latter in the course of a very vigorous speech, which was listened to with great attention, discussed somewhat in detail the allegations directed against the hospital and ambulance arrangements in South Africa. The Royal Army Medical Corps have in the past not been without honour and appreciation, but now a change seemed to have come over the spirit of their dreams and criticism was in certain quarters rife. The service had still, however, its friends; and the support of such men as Sir William Mac Cormac, Mr. Treves, and Sir Redvers Buller, none of whom would give praise where it was undeserved, would have to be reckoned with. Lord Roberts, too, whose sympathy with the soldiers was a household word, would not have expressed his satisfaction at the arrangements had they been, as is alleged by some, insufficient in character and extent. There was also one other opinion that he (Dr. Jameson) valued most highly, and it was that of the German military medical attachés. They were with the British medical staff and had afforded them valuable assistance on many occasions. When the Germans returned to England he asked them if they had any improvements to suggest and they answered, "We have nothing to suggest." On the other hand, what were the qualifications of the men who criticised them? He (Dr. Jameson) had read the criticisms in question when he was on his way to Ireland; he thought they were much exaggerated and he determined, like Mr. Rhodes, to come back to London and "face the music." As he drove back through the streets of London the placards referring to "hospital scandals" and "atrocities" raised a question in his mind whether they were not working up to a prominent position in Madame Tussaud's collection. His duty was to provide beds for 10 per cent. of the troops and this had been done, and a *personnel* of over 8000 men and women had been provided for these beds. So liberal, indeed, had been the allowances that on several occasions he had been asked to furnish no further equipment, and on Thursday last he received a telegram from South Africa in these words: "Please do not send any more base hospitals." It was well known to the medical officers that exigencies might arise with which no service in the world could deal, and had the outbreak of enteric fever which was here the subject of consideration occurred in London itself the hospitals of the metropolis would not have been able to cope with the situation. The commission which had been appointed would bring out the truth, and the Army Medical Department asked for nothing other than this.

Sir JOSEPH FAYRER proposed the toast of "The Founders of the Epidemiological Society," and in a most interesting speech traced the history of the society's foundation. He referred to the circumstances which obtained in England just prior to 1850 and to the fact that the society, arriving, as it were, at the psychological moment, carried all before it. Amongst its founders were numbered the leaders of science and medicine of the day and the work which the society did was so much appreciated in Europe that Hirsch in 1860 dedicated the first edition of his now classical "Historical and Geographical Pathology" to it. Sir Joseph Fayrer referred to the valuable work performed by the several committees of the society and to the influence which the society had had in directing the Legislature with regard to the control of small-pox by means of vaccination. A reference to the list of presidents would at once convince the reader that in this particular the society, which might justly be termed "the father of preventive medicine societies," had been exceptionally fortunate. As regards the jubilee it had been determined that the event might be well and usefully marked by publishing an Index of the valuable papers which have appeared in the Transactions. Sir Joseph Fayrer paid a fitting tribute to the valuable contributions which had been made to the science of epidemiology by the writings of the outgoing President, Dr. Franklin Parsons, and he predicted that under the guidance of the President-elect, Dr. Patrick Manson, whose work in tropical diseases had been recently appreciated by the Royal Society, the society would enter upon the second 50 years' work with unabated vigour and utility. Of the names which appeared upon the historic roll of the founders there were but two survivors, Sir John Simon, K.C.B., and Sir Edward Sieveking, and age alone prevented their attendance at the feast. He proposed, however, that the names of these gentlemen should be coupled with the toast and that a telegram be despatched to each of them conveying to them a hearty greeting, a suggestion which was most cordially accepted and acted upon.

The toast of "The Public Health Service" was proposed by Dr. FARQUHARSON, M.P., and responded to by Mr. T. W. RUSSELL, M.P.

Dr. PATRICK MANSON proposed the toast of "The Visitors," and coupled with it the names of the President of the Royal College of Physicians and Sir James Crichton Browne.

Dr. CHURCH, who met with a very cordial reception, was unable to pass over in silence the fact that he had consented to take a place in the commission which was to proceed to South Africa to investigate the provisions made for the sick and wounded. He felt when Lord Lansdowne sent for him that unless he (Dr. Church) did what an Englishman never did—i.e., shirked his duty—he could not refuse to take part in the commission in question. He trusted, however, that all who knew him felt that he would enter upon the arduous and responsible duty which had devolved upon him with perfect impartiality. He could not but have a high regard for the Army Medical Service, but he trusted that this fact would in no sense preclude him from approaching the inquiry with a mind entirely free from bias. Dr. Church referred in a highly appreciative manner to the admirable work performed by the Epidemiological Society in elucidating the causes of epidemic diseases, and expressed regret that he had not himself been actively engaged in the work of the society. He trusted, however, that in spite of his having no special knowledge in this sense he was not without a certain amount of that commodity which the House of Commons were unwilling to allow that the medical profession possessed—i.e., common sense—and he hoped that by making use of that faculty he might be able to be of some use to his country.

Sir WILLIAM BROADBENT proposed the toast of "The President and Officers of the Society," which was responded to by Dr. PARSONS and Dr. BULSTRODE. The society had, Dr. Parsons stated, received many letters of regret and appreciation from different parts of the world and one which had just arrived from Russia ran as follows: "The young Russian Society of Preventive Medicine greets the venerable Epidemiological Society and heartily wishes it further flourishment.—President, Prince Petr of Oldenburg; Member of Council, Dr. Leo Berthenson; Secretary, Dr. Vonitch." Dr. Parsons referred in appreciative terms to the manner in which his work as President had been supported by the efforts of the treasurer and honorary secretaries, one of whom, Dr. Washbourn, was at that moment serving his country in South Africa. The Index to which Sir Joseph Fayrer had referred was, he added, compiled by Mrs. H. T. Bulstrode.

ASYLUM REPORTS.

The Nottingham City Asylum, Mapperley Hill (Annual Report for 1899).—The average number of patients resident during the year was 659 and comprised 311 males and 348 females. There were 22 private patients in residence during the year, eight of them being males and 14 females. 152 patients were admitted during the year, 74 being males and 78 females. The admission rate was the lowest since 1891 and was 16 below the average for the past five years. Among the admissions there was an unusual number of senile cases, and many of the patients were in a weak and emaciated physical condition. Mr. Evan Powell, the medical superintendent, states in his report that the cases admitted were on the whole of an unfavourable character as regards hope of recovery. As to causes there was nothing unusual noticed; drink and hereditary influences headed the list. There were 62 patients discharged as recovered during the year, 32 being males and 30 being females, a total of 9·4 per cent. of the average number resident. Four female chronic patients were removed to the workhouse to make room for acute cases. The number of deaths during the year numbered 59, as against 53 in the previous year, or 9 per cent. of the average number resident. Of the deaths three were due to cardiac valvular disease, three to senile decay, three to epilepsy, four to bronchitis, four to cerebral atrophy, seven to phthisis, and 19 to general paralysis of the insane. "There is still much overcrowding in the female division, and as a consequence of this erysipelas has made its appearance on more than one occasion.

Besides the danger to the health of the patients the congested state of the wards renders it very difficult to treat the cases properly." The report states that the new female wing of the asylum will probably be ready for occupation in midsummer, 1900, when the overcrowding will be relieved temporarily, but the further steps to be taken for providing additional accommodation will be a matter for very serious consideration. Two of the sanitary blocks on the female side have been enlarged in a satisfactory manner. A female patient who was admitted in February gave birth to a full-term male child in August. The child was removed by the father, but the mother is still a patient in the asylum and is not likely to recover. The only casualty of a serious nature occurred in the female side, where a patient who was accidentally pushed down by another sustained a fracture of the neck of the femur. Four male and three female patients made their escape, but all were retaken after short periods of absence except two of the men, who succeeded in remaining away for the statutory 14 days when they were considered as discharged. The Lunacy Commissioners in their report state that a small isolation block should be provided for infec tious cases. "Had it not been that a patient recently attacked by scarlet fever was a small idiot child and could therefore be treated in the public fever hospital the present isolation hospital would have had to be emptied of the patients now residing there and much inconvenience and discomfort would have arisen." The Commissioners have had one grievance brought to their notice which they think is a substantial one, and that is "that the patients are taken to the Guildhall to be seen by the justices before they are sent to the asylum, as if they were criminals, and not visited in their own homes as sick persons would expect to be." The Commissioners advert to the insufficiency of the staff in No. 8 ward, where there were 45 patients, of whom 11 were in bed and eight were actively suicidal, in charge of four nurses. Post-mortem examinations were made in 88 per cent. of the deaths, and bed-sores were found to be present in 7 per cent. The case-books and other medical records are carefully kept and some pathological work is done, the committee having made the necessary additions to the appliances for the latter purpose.

Leicester Borough Asylum, West Humberstone (Annual Report for 1899).—The average population of the asylum was 561 patients—viz., 262 males and 299 females. The admissions during the year were 118, and comprised 49 males and 69 females. Dr. J. E. Montague Finch, the medical superintendent, states in his report that of the 118 admissions 27 had previously been patients in the asylum. "Many of the cases were in extremely feeble health when admitted. Two died on the day of admission and one on the third day. Many were bedridden and two were over 80 years." The chief cause of insanity among the patients admitted was hereditary tendency, which was a factor in 42 cases. Among the other causes were the following: intemperance in drink nine causes, mental worry and domestic trouble 10 cases, and senile brain decay five cases. The cases discharged as cured during the year amounted to 57—viz., 25 males and 32 females—a total of 10·1 per cent of the average number resident. The number of deaths during the year amounted to 30—viz., 19 males and 11 females, or 5 3 per cent. of the average number resident. Of the deaths two were due to cancer, two to phthisis, three to renal diseases, three to senile decay, five to cardiac disease, and nine to general paralysis of the insane. One death—viz., that of an elderly male patient—was due to suicide by cutting the throat. "Three inquests were held upon patients who died during the year. In two of these cases the patients were in a moribund condition when admitted." One of them died within an hour of admission from pulmonary apoplexy, and the other died within 12 hours of admission in an advanced stage of phthisis. The third inquest was on a case of suicide which occurred while the patient was out upon trial in charge of his friends after an absence from the asylum of some weeks. The general health of the asylum has been fairly good, and no disease of an epidemic character has occurred with the exception of a few sporadic cases of influenza. The only accident of a serious character was a fracture of the radius sustained by a patient during a struggle with another. A male patient escaped while at work on the farm and was not recaptured. On July 20th the memorial stone of the asylum extension was laid by Mr. George Clifton, the chairman of the committee, who at the time was also Mayor of Leicester. The main structure is now approaching completion, but there still remains a large amount of woodwork and other fittings to be done. "In the meantime it becomes more and more difficult to find accommodation for the increasing number of patients. ..... As at present determined, the contemplated additional blocks for 100 male patients and 30 female patients are not to be proceeded with, but it is more than probable that these will be required before many years have elapsed." The changes in the staff of attendants have been numerous, more especially towards the end of the year, when several reservists had to join the army. In these cases it was arranged by the committee that the dependent relatives should have an amount equal to half-pay during the absence of the attendant, and that he should be reinstated upon his return to civil life. The Lunacy Commissioners in their report state that they hope the committee will consider the propriety of erecting a new and detached building in preference to enlarging the present building for patients. An adequate staff continues to be maintained, giving one attendant for every 11 male patients and a nurse for every 10 female patients. The case books and medical records are stated to be well kept.

East Sussex County Asylum, Hayward's Heath (Annual Report for 1899).—The average number of patients resident during the year was 921, and comprised 388 males and 533 females. The number of admissions during the year amounted to 271, including 119 males and 152 females. Of these 44—viz., 19 males and 25 females—were re-admissions. Dr. C. E. Saunders, the medical superintendent, states in his report that the admissions show an actual increase of four males and 24 females on those of the previous year. As regards the expectancy of recovery 51 out of 109 males and 68 out of 150 females are tabulated as bad or hopeless. Of the male patients admitted 35 are regarded as actively suicidal and of the females 54 are so included. The patients discharged as recovered during the year amounted to 85 and comprised 38 males and 47 females, a total of 9·2 per cent. of the average number resident. The deaths during the year amounted to 90—viz., 44 males and 46 females—a total of 9·7 per cent. as calculated on the same basis. Of the deaths three were due to renal disease, four to pneumonia, two to broncho-pneumonia, three to bronchitis, five to phthisis, six to senile decay, seven to cardiac disease, 18 to organic brain disease (cerebral softening, atrophy, or tumour), and 18 to general paralysis of the insane. In one instance only was a coroner's inquest held, viz., in a case of death due to peritonitis caused by the perforation of a gall-stone. Accidents and casualties have been for the most part of an unimportant character and in no instance fatal. "This is a matter for congratulation, because the number of suicidal cases have been very numerous, and at one time there were no less than four patients admitted with cut throats within a few weeks of one another." Temporary buildings to accommodate 50 males and 50 females in two blocks were commenced in October, 1898, and will be shortly occupied. In June there was an outbreak of scarlet fever on the male side, and 16 persons were attacked, but all the cases had a non-fatal termination. The origin of the outbreak could not be traced, but there was a considerable epidemic in the neighbourhood at the time. Lectures were given to nurses and attendants during the winter to qualify for the certificate of the Medico-Psychological Association, and no less than eight nurses and 13 attendants were successful in obtaining certificates. The Lunacy Commissioners in their report draw attention to the fact that post-mortem examinations were made in only 34 per cent. of the fatal cases, and they "regret that so few post-mortems should be made here in comparison with most other asylums," for much importance is attached by them to the practice. Influenza appeared during the year and attacked 19 patients and 12 members of the staff. The number of patients deemed to be actually suicidal is returned as 75, or 8 per cent. of the total number resident, and the Lunacy Commissioners point out that "a staff of the strength which exists here must find it impossible to obey strictly the injunction of the cautionary parchment issued for these patients that they should never be left alone. It may be a question whether the feeling by attendants that this is so may not lead to a perfunctory discharge of the duty." The sanatorium is badly furnished with exits in case of fire, there being but one central staircase, and the Commissioners urge "that the defect should be somehow remedied. The medical records are duly kept. We must

express the opinion that with the addition of 100 patients to be housed in the iron buildings the services of a third assistant medical officer will be necessary." A third assistant medical officer has since been appointed.

NOTES FROM INDIA.

(FROM OUR SPECIAL CORRESPONDENT.)

The Extent of the Famine.—The Prospects of the Plague Epidemic.—A New Policy in Calcutta.

THE gifts of grain and money which are being sent from all parts of the world to relieve the starving natives of India show very imperfectly the real state of affairs. The accompanying table, which gives the number of persons in receipt of relief during the two weeks ending June 23rd in each province, pictures the enormous numbers affected as well as the widespread character of the distress:—

Name of Province.	Week ending June 16th. Relief works.	Gratuitous relief.	Total.	Week ending June 23rd. Relief works.	Gratuitous relief.	Total.	Increase or decrease.
BRITISH PROVINCES.							
Madras	12,701	3,150	15,851	13,704	3,140	16,844	+993
Bombay and Sindh	1,104,086	204,509	1,308,595	1,149,633	228,667	1,378,300*	+69,705
Bengal	7,417	160	7,577	5,100	1,892	6,992	-585
North-West Provinces and Oudh	1,048	727	2,135	1,974	781	2,755	+620
Punjab	134,772	31,147	165,919	128,297	32,143	160,440†	-5,479
Central Provinces	1,237,632	733,899	1,971,531	1,123,640	817,743	1,941,383	-30,148
Berar	361,857	103,610	465,467	359,802	120,101	479,903	+14,436
Ajmere-Merwara	106,356	28,729	135,085	113,229	30,050	143,279	+8,194
Total British Provinces	2,966,229	1,105,931	4,072,160	2,895,379	1,234,517	4,129,896	+57,736
NATIVE STATES.							
Rajputana States	364,494	123,879	488,373	350,426	142,069	492,495‡	+4,122
Central India States	178,868	38,095	216,963	117,987	31,681	149,668	-67,295
Hyderabad	419,528	65,941	485,469	410,126	82,919	493,045	+7,576
Baroda	56,672	35,141	91,813	64,884	34,153	89,037	-2,776
Bombay Native States	492,819	62,458	496,277	414,201	53,241	467,442	-27,835
Punjab Native States	27,308	22,498	49,006	24,056	12,285	35,341	-13,465
Central Provinces Feudatory States	40,306	27,593	67,899	33,922	30,178	64,100	-3,799
Kashmir (Jammu)	—	—	—	1,062	—	1,062	+1,062
Total Native States	1,519,995	375,605	1,895,600	1,406,664	386,526	1,793,190	-102,410
Grand Total	4,486,224	1,481,536	5,967,760	4,302,043	1,621,043	5,923,086	-44,674

* Figures incomplete. † Return for the Umbala district wanting; the previous week's figures have been included.
‡ Returns for the States of Kherwara, Dungapur, Kotra, and Kushalgarh in Rajputana, and for the States of Dewas (Senior and Junior Branches), Bagli, Pathari, and Karaudia in Central India, are wanting; the previous week's figures for these States have been included.

I have to record a still further diminution in the number of deaths from plague throughout India. Last week there were only 282 deaths officially returned as due to plague. Of these, 106 occurred in Bombay and 108 in Calcutta. The North-West Provinces, the Punjab, the Central Provinces, Rajputana, and Aden were clear. Bombay city still returns a high general mortality—viz., 1048 for last week—a rate of over 66 per 1000 per annum. There were only 89 deaths from cholera returned and no other epidemic disease exists to explain the excess. It is pretty obvious that plague continues and is unrecognised to a much larger extent than is supposed. This rapid diminution in the mortality from plague in all parts of India must not be allowed to lull us into false hopes of a final disappearance of the disease from the country. The chances seem to be that while certain places hitherto severely attacked may not suffer so markedly in the future there are numerous areas only recently infected which will go through a series of recurrences.

The Bengal Government have just issued a letter concerning the prevalence of cases of plague in certain areas of Calcutta and directing that those areas should be more extensively disinfected. It is suggested by Government that disinfection of the entire tenement in which a case of plague has occurred should be carried out, the principle underlying the memorandum being that wider measures of disinfection should be practised. This seems at first sight a very reasonable policy; but it is by no means novel. The extraordinary part of this plague measure is that it is not accompanied by the conferring of any further powers on the plague authorities. The person who enters a tenement where a case of plague does not exist or has not existed is a trespasser and the authorities have no legal powers. The only way to carry out this extra disinfection is by an assumption of legal power which the officers do not possess. It would be much more straightforward to say outright that wholesale disinfection has got to be done, and that the officers concerned will have the full legal powers to perform it. At the present time it is not uncommon, I am informed, for offers of disinfection to be rejected. Considering that this measure of disinfection is now the sum and substance of all plague policy it seems extraordinary that it should be left to the will of the people. The consequence is that a very large number of houses which ought to be disinfected escape being treated.

June 28th.

THE SWANSEA GENERAL HOSPITAL.—The annual general meeting of this institution was recently held under the presidency of Colonel Morgan. The report stated that 892 in-patients had been admitted during 1899, the daily average number of occupied beds being 90·1, against 84 in 1898. The out-patients numbered 4392. The financial statement showed that during the year the adverse balance was reduced from £1391 to £845. The annual income was greater by £244. The workpeople's contributions showed an increase of £359, Baroness Patti-Cederstrom's concert realised £360 for the charity, and the house-to-house collections reached £418. During the year several much-needed improvements had been carried out in the building.

Public Health and Poor Law.

LOCAL GOVERNMENT DEPARTMENT.

REPORTS OF INSPECTORS OF THE MEDICAL DEPARTMENT OF THE LOCAL GOVERNMENT BOARD.

On Enteric Fever in the City of Chichester.[1] by Dr. THEODORE THOMSON and Colonel J. T. MARSH, R.E.—This inquiry was ordered by the Local Government Board in response to local appeal from Chichester for help to ascertain the reason of the excessive typhoid fever prevalence in that city in recent years and particularly in 1898. The liability of this town to repeated recurrence of enteric fever in serious amount was well known and investigations had already been made by the Local Government Board in previous years.

The present area of Chichester is 1595 acres and its population is estimated at about 11,500. In general it may be said to stand on a gravel flat overlying clay of the London and Reading beds. Its water is derived partly from private wells sunk in the gravel but principally from a public supply obtained from deep wells in the chalk. Excrement disposal is effected either by water-closets or by cesspit privies; water-closets drain either to the sewers or to cesspools. An extensive and apparently well designed sewerage system was carried out in 1893–95, and nearly three-fourths of the houses now drain to the sewers. The principal difficulty with Chichester sewers has been to exclude subsoil water. Notwithstanding many alterations since the sewers were laid down subsoil water is still admitted in very large quantities; correspondingly, no doubt, sewage escapes into the subsoil water. Enteric fever prevalence in Chichester may be illustrated by the following table given by the inspectors:—

Period.	City of Chichester.			England and Wales: enteric fever death-rate per 1000 living.
	Estimated population.	Enteric fever deaths.	Enteric fever death-rate per 1000 living.	
1871–75	7,890	11	0·28	0·37
1876–80	8,020	26	0·65	0·28
1881–85	8,040	17	0·42	0·22
1886–90	7,920	12	0·23	0·18
1891–95	7,760	3	0·08	0·17
1896–98	11,000	21	0·64	0·17

It will be noticed that typhoid fever mortality in Chichester, having been in excess of that of England and Wales throughout the 15 years 1876–90, fell below it in 1891–95, but again rose to a very high level in the three years 1896–98. As regards notified cases of the disease, in 1896 there were 116, in 1897 there were 129, in 1898 there were 100, and in 1899, according to a postscript to the report, 76 cases had occurred up to the end of September. Dr. Thomson gives an account of a comprehensive study of the incidence of enteric fever on locality in Chichester, illustrated by two series of maps. One set shows the position of invaded dwellings in each of the years 1896, 1897, and 1898—the dates on the maps themselves have evidently been misprinted—another shows the distribution of deaths referred to enteric fever and continued fever during (*a*) the period 1870–84 and (*b*) the period 1885–98. This last set is instructive. No safe conclusions as to distribution of enteric fever on locality could be drawn from the comparatively small number of deaths in any given year, but in the combinations of 15 and 14 years, notwithstanding obvious possibilities of error, there is a much greater chance of obtaining an approximation to the facts. Similar maps might be constructed with advantage for other places than Chichester.

Study of the maps shows that in the three years 1896–98 enteric fever has shown a distinct preference for particular quarters of Chichester, especially certain parts which lie outside the line of the old city walls. During the remaining 25 years under consideration, however, the distribution does not always appear to have been the same. Thus in the earlier years the area within the line of the city walls seems to have had no such comparative immunity from typhoid fever as has latterly been the case.

Space does not allow us to follow Dr. Thomson in his discussion of the sundry causes of enteric fever in their possible application to the phenomena of its endemic prevalence in Chichester. After exhaustive consideration he is able to eliminate from any important share in the maintenance of the disease the consumption of infected milk and shellfish—no reference is made to other foods which occasionally have been known to convey typhoid infection—the use of infected drinking-water, infection by way of sewers, changes in rainfall, and variations in level of the subsoil water. Accusations which some of the inhabitants of Chichester appear to have brought against their recent works of sewerage that these works had directly or indirectly brought upon the town the recrudescence of its enteric fever the inspectors show good grounds for disbelieving. There was not, as a whole, a disproportionately heavy incidence of fever on the sewered population, there was no parallelism between the behaviour of the fever in the several subdivisions of the town and the sewerage conditions of those subdivisions, nor were there any facts indicating that infective sewer air could have explained the local incidence. By a process of exclusion of the above factors the question of soil is arrived at. The localities specially affected during 1896–98 are considered in their relation to soil and to opportunities of soil pollution. One point is particularly worthy of attention—that the poorer neighbourhoods where the fouling of the soil is likely to be greater than elsewhere have during the three years 1896–98 suffered most heavily. Nevertheless this does not seem to have held good during the earlier period 1870–84, when no special preference for the poorest neighbourhoods seems to have been shown. Again, although in some instances there seems to have been a greater proportionate incidence of fever upon neighbourhoods where cesspit privies preponderate over cesspools, when the whole period is reviewed cesspool and cesspit privy neighbourhoods seem to have suffered in much the same degree. From these and many other considerations the inspectors conclude that the mere fact of there being abundant opportunities of soil pollution in Chichester does not suffice as an explanation of the long-continued prevalence of enteric fever in serious amount there. Nevertheless as a result of a careful investigation of local circumstances they are disposed to see a possible explanation in the existence of certain soil conditions peculiar to Chichester or which Chichester may share with other towns in which enteric fever is endemic. "Hypothesis of the existence in Chichester of soil conditions especially favourable to the viability and growth of the infective material of enteric fever is not inconsistent with the facts ascertained by us and set out in this report. But, on the other hand, such hypothesis, while not inconsistent with these facts, does not at present afford an adequate explanation of features that have characterised the fever in its distribution in time and place in Chichester. Fuller knowledge of soil conditions in their relations with fever prevalence may account for these features; without that knowledge it is not possible to arrive at definite conclusions." Few will question the desirability of further research into the subject. Not the least valuable part of this report is that containing suggestions as to the lines upon which an inquiry should be conducted, which is "urgently called for in the interests not only of Chichester but also of not a few other localities in this country where enteric fever is endemically prevalent in such amount as to take year after year a toll of deaths greatly in excess of the proportion claimed by this disease in England and Wales as a whole."

[1] London: Eyre and Spottiswoode, East Harding-street; Edinburgh: John Menzies and Co.; Dublin: Hodges, Figgis, and Co. Price 4s. 6d.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN 33 of the largest English towns 6470 births and 3476 deaths were registered during the week ending July 14th. The annual rate of mortality in these towns, which had been 15·1 and 14·5 per 1000 in the two preceding weeks, rose again to 15·6 last week. In London the rate was 14·2 per 1000, while it averaged 16·5 in the 32 provincial towns. The lowest death-rates in these towns were 9·6 in Portsmouth, 11·1 in West Ham, 11·3 in Brighton, and 11·5 in Croydon; the highest rates were 19·7 in Oldham, 19·8 in Newcastle, 20·0 in Manchester and in Gateshead, and 20·9 in Liverpool. The 3476 deaths in

these towns included 427 which were referred to the principal zymotic diseases, against 419 and 344 in the two preceding weeks; of these 104 resulted from measles, 102 from diarrhœa, 96 from whooping-cough, 72 from diphtheria, 27 from "fever" (principally enteric), 24 from scarlet fever, and two from small-pox. No fatal case of any of these diseases occurred last week in Norwich; in the other towns they caused the lowest death-rates in Portsmouth, Bolton, Preston, Bradford, and Leeds, and the highest rates in Cardiff, Derby, Sheffield, and Gateshead. The greatest mortality from measles occurred in Derby, Oldham, Sunderland, and Newcastle; from whooping-cough in Derby, Burnley, Sheffield, and Gateshead; from "fever" in Huddersfield and Wolverhampton; and from diarrhœa in Blackburn, Sheffield, and Gateshead. The mortality from scarlet fever showed no marked excess in any of the large towns. The 72 deaths from diphtheria included 26 in London, nine in Leicester, five in Cardiff, five in Salford, and five in Sheffield. One fatal case of small-pox was registered last week in Liverpool and one in Oldham, but not one in any other of the 33 large towns. There were 17 cases of small-pox in the Metropolitan Asylums Hospitals on Saturday last, July 14th, against 16 and 17 at the end of the two preceding weeks; four new cases were admitted during the week, against eight and four in the two preceding weeks. The number of scarlet fever patients in these hospitals and in the London Fever Hospital at the end of the week was 1861, against numbers increasing from 1754 to 1843 in the five preceding Saturdays; 208 new cases were admitted during the week, against 219, 210, and 229 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had declined from 268 to 140 in the five preceding weeks, rose again to 160 last week, but were 26 below the corrected average. The causes of 34, or 1·0 per cent., of the deaths in the 33 towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Bristol, Leicester, Nottingham, Hull, and Newcastle; the largest proportions of uncertified deaths were registered in Brighton, Birmingham, and Liverpool.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had been 17·9 and 17·7 per 1000 in the two preceding weeks, further declined to 17·2 per 1000 during the week ending July 14th, but was 1·6 per 1000 above the mean rate during the same period in the 33 large English towns. The rates in the eight Scotch towns ranged from 10·6 in Leith and 15·1 in Aberdeen to 18·1 in Edinburgh and 20·5 in Dundee. The 533 deaths in these towns included 23 which were referred to diarrhœa, 21 to whooping-cough, 17 to measles, seven to scarlet fever, four to diphtheria, one to small-pox, and not one to "fever." In all 73 deaths resulted from these principal zymotic diseases, against 83 and 85 in the two preceding weeks. These 73 deaths were equal to an annual rate of 2·4 per 1000, which was 0·5 per 1000 above the mean rate last week from the same diseases in the 33 large English towns. The fatal cases of diarrhœa, which had increased from 19 to 32 in the three preceding weeks, declined again last week to 23, of which nine occurred in Glasgow, five in Greenock, two in Edinburgh, two in Dundee, two in Aberdeen, and two in Paisley. The deaths from whooping-cough, which had been 26 and 22 in the two preceding weeks, further declined to 21 last week, and included 12 in Glasgow, two in Dundee, and two in Paisley. The fatal cases of measles, which had risen from 14 to 20 in the three preceding weeks, declined again last week to 17, of which nine were registered in Glasgow, six in Edinburgh, and two in Paisley. The deaths from scarlet fever, which had been seven and four in the two preceding weeks, rose again to seven last week and included five in Glasgow. The fatal cases of diphtheria, which had been two in each of the two preceding weeks, rose last week to four, of which three occurred in Glasgow, where the fatal case of small-pox was also registered. The deaths referred to diseases of the respiratory organs in these towns, which had been 97 and 72 in the two preceding weeks, further declined last week to 71, but exceeded by 18 the number recorded in the corresponding period of last year. The causes of 35, or nearly 7 per cent., of the deaths in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 20·0 and 17·3 per 1000 in the two preceding weeks, rose again to 18·2 during the week ending July 14th. During the past four weeks the death-rate in the city has averaged 18·5 per 1000, the rate during the same period being 13·9 in London and 17·1 in Edinburgh. The 122 deaths belonging to Dublin registered during the week under notice were three in excess of the number in the preceding week, and included eight which were referred to the principal zymotic diseases, against three and six in the two preceding weeks; of these, four resulted from whooping-cough, three from "fever," and one from diarrhœa. These eight deaths were equal to an annual rate of 1·2 per 1000, the zymotic death-rate during the same period being 1·8 in London and 1·9 in Edinburgh. The fatal cases of whooping-cough, which had been one, two, and three in the three preceding weeks, further rose to four last week. The deaths referred to "fever," which had been two, nil, and one in the three preceding weeks, rose last week to three. The 122 deaths in Dublin last week included 16 of infants under one year of age and 28 of persons aged upwards of 60 years; the deaths of infants showed a decline, while those of elderly persons exceeded the number recorded in the preceding week. Eight inquest cases and five deaths from violence were registered; and 60, or nearly one-half, of the deaths occurred in public institutions. The causes of two, or 1·7 per cent., of the deaths in the city last week were not certified.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

Deputy-Inspector-General H. T. Cox is appointed to Plymouth Hospital.

ROYAL ARMY MEDICAL CORPS.

During the absence on leave of the Principal Medical Officer in Ireland till August 4th his duties will be performed by Lieutenant-Colonel F. G. Adye-Curran. Surgeon (on probation) A. D. Jameson has arrived in London for temporary duty. Major F. M. Baker, from half-pay, to be Major, with precedence next below Major S. C. B. Robinson, vice J. Minniece, deceased. Lieutenant-Colonel Samuel James Flood retires on retired pay on account of ill-health. Temporary Lieutenant George Black. Surgeon-Lieutenant 2nd Volunteer Battalion the Royal Sussex Regiment, is granted the temporary rank of Captain whilst employed in South Africa.

INDIA AND THE INDIAN MEDICAL SERVICES.

The Queen has approved of the promotion of Lieutenant-Colonel John Thomas Brownrigg Bookey, Bengal Establishment, to Colonel. Her Majesty has also approved of the retirement from the service of the undermentioned officers:—*Bengal Establishment:* Lieutenant-Colonel Charles Joseph McCartie, Lieutenant-Colonel Dennis Wood Deane Comins, and Lieutenant-Colonel John Francis Tuohy.

VOLUNTEER CORPS.

Submarine Miners: The Severn Division: John David Williams to be Surgeon-Lieutenant. *Rifle:* 1st Volunteer Battalion the King's Own (Royal Lancaster Regiment): Captain Richard John Morris resigns his commission and is appointed Surgeon-Lieutenant. 2nd Volunteer Battalion the Royal Scots Fusiliers: Surgeon-Lieutenant W. Roxburgh to be Surgeon-Captain. 1st Volunteer Battalion the Northamptonshire Regiment: Surgeon-Captain E. P. Dickin resigns his commission. 1st Volunteer Battalion the Gordon Highlanders: John Farquhar Christie to be Surgeon-Lieutenant. 24th Middlesex: Surgeon-Captain J. D. Grant to be Surgeon-Major.

TRANSVAAL WAR NOTES.

Lieutenant-Colonel Kenny, R.A.M.C., Major Tuke, R.A.M.C., Major Blenkinsop, R.A.M.C., and Major Hathaway, R.A.M.C., left Cape Town invalided in the *Aurania* on July 7th for England.

We understand that the Sick and Wounded Officers' Surgical and Medical Aid Committee, originally formed to provide medical and surgical aid for those who have suffered in South Africa, are equally prepared to render assistance to

officers returning home from other theatres of war. Applications should be addressed to the Hon. Arthur Brodrick at Hampden House.

The *Times* announces that in connexion with Princess Christian's Homes of Rest for Discharged Soldiers and Sailors now in course of erection at Bisley, Her Majesty the Queen has been graciously pleased to endow two beds, their Royal Highnesses the Duke and Duchess of York endow one bed for a soldier or sailor, her Royal Highness Princess Christian of Schleswig-Holstein one bed for the King's Royal Rifles, and their Highnesses Princess Victoria of Schleswig-Holstein and Princess Aribert of Anhalt a bed for a "Greenjacket."

The following steamships have arrived at Southampton carrying invalids and wounded men from South Africa. The *Kildonan Castle* arrived on July 11th and the *Dunera* on July 12th. From the former 100 patients were admitted at the Royal Victoria Hospital, Netley, and from the latter 11 cases. Only the severe cases were sent to Netley, the remainder being sent on to other stations. At Netley eight wards are now full of patients suffering from enteric fever.

Major A. S. Rose is in medical charge of the hospital ship *Aroca* which left Southampton for South Africa on July 18th.

Lieutenant Morris, R.A.M.C., has left England for duty in South Africa.

THE SOUTH AFRICAN COMMISSION.

This matter has now been definitely settled and the commission has been increased from three to five by the addition of two lay members with undeniable business qualifications. An objection was raised from the first to one of the three eminent names submitted by the Government. It is absurd to suppose that a man of the high personal character and integrity of Professor Cunningham will not bring to the work a perfectly unbiased judgment; it would be an insult to him to suppose otherwise. It is rather on the score of his scientific attainments in a special direction that we ventured to think that a man of far less scientific reputation might have proved better adapted and more useful for conducting such an investigation. We think, too, that the commission will, in the first instance, have to learn its business from the evidence that will be brought before it, and that for various practical reasons it would have been well if it had someone at hand well versed in military systems. There was no reason why such an individual should have taken part in the deliberations of the commission or signed its report. But it has been ruled otherwise. We may call our readers' attention to an article in the *Standard* of July 18th on the subject of this commission.

DEATHS IN THE SERVICES.

Surgeon-Lieutenant-Colonel William Wellington Lake, M.M.S.C., Volunteer Company Royal Army Medical Corps, at Bloemfontein of Bright's disease, on July 13th. Educated at St. Thomas's Hospital, he was admitted a Licentiate of the Royal College of Apothecaries in 1876, and a Member of the Royal College of Surgeons of England in 1877. In 1898 he was appointed surgeon-major of the Militia Medical Staff Corps and volunteered for service and went to South Africa with the Volunteer Company of the Royal Army Medical Corps in the early part of this year. For active service in the field as a surgeon in the Ottoman army he received the medal and the fourth class of the Medjidieh for his services during the Russo-Turkish war of 1877-8. Mr. Wellington Lake held many public appointments, among them being those of deputy coroner for West Surrey and medical officer of health for the Guildford and Woking districts of the same county.

THE ASHANTI CAMPAIGN.

With so many other and bigger matters on hand in China and South Africa it is not surprising that recent events in Ashanti and the little campaign for the relief of Kumasi have been comparatively lost sight of. But there has been a fine exhibition of British courage, endurance, and skilful management of late in this very unhealthy and malarious part of the world. What with the fighting with savages and fever, short rations, flooded districts, and trying marches there must have been a good number of wounded and a great deal of sickness, and the wonder is whether medical aid, quinine, and suitable or even sufficient food for the sick were obtainable. It seems to be nearly certain, however, that Colonel Willcocks has succeeded in relieving the hard-pressed garrison at Kumasi.

LEAN'S ROYAL NAVY LIST.

Lean's Royal Navy List, published by Messrs. Witherby and Co., 326, High Holborn, and 4, Newman's-court, Cornhill, price 7*s.* 6*d.*, is so well known and is of such practical utility that scarcely anything is required but a reminder to our readers that a new issue is ready. We note, however, that the July issue of this quarterly "complete encyclopædia of our first line of defence," which is now ready, includes the war and meritorious services in South Africa of naval officers connected with that campaign.

THE ORDER OF THE MEDJIDIEH.

The Queen has given her Royal authority that Major Richard Hugh Penton, D.S.O., R.A.M.C., may accept and wear the insignia of the Imperial Ottoman Order of the Medjidieh (third class) conferred by His Highness the Khedive of Egypt, authorised by His Imperial Majesty the Sultan of Turkey in recognition of service in the Soudan during the year 1899.

MILITARY HOSPITAL, DEVONPORT.

280 invalid soldiers arrived at the Military Hospital, Devonport, on July 14th, and 350 were disembarked at Plymouth subsequently.

Correspondence.

"Audi alteram partem."

FACTORY GIRLS' COUNTRY HOLIDAY FUND.

To the Editors of THE LANCET.

SIRS,—We again beg for the powerful aid of the press on behalf of the Factory Girls' Country Holiday Fund. Owing to the liberal help of the public we were able last year to give a country holiday of a week or more to 2200 working girls and women employed in all parts of London in factories and workshops. So many are again waiting to go that we are compelled to make a very urgent appeal for funds. Many of these toilers know nothing of the delights of country life and surroundings. Those who have been away appreciate the change and rest more every year and for months save a few pence weekly out of their scanty earnings towards their expenses; £515 were contributed by them in this way last year. They are sent to the seaside and to country villages, and the greatest care is taken in making all arrangements for their holiday. The cottagers with whom they are boarded and the ladies, clergy, and others who look after them during their stay do their utmost to give them a happy holiday; the cottagers in many cases beg to have the same visitors year after year. When it is remembered that many of the girls are little more than children of 14 years of age and upwards, spending the best part of their lives in hot crowded factories, and that in many cases they are in large measure the breadwinners of the family, we feel sure that their claim for a short holiday in fresh air and country surroundings with freedom from daily toil and worry will not be disregarded.

We are, Sirs, yours obediently,

(Signed) M. LONDIN,
EDW. ROFFEN,
BEATRICE B. TEMPLE,
G. F. BRISTOL,
E. GARRETT ANDERSON, M.D. Paris,
FRANK LLOYD,
H. ADLER, Chief Rabbi,
EDWARD CANNEY, Chairman of the Executive Committee.

MARGARET A. WYATT, Honorary Treasurer.

S. Peter's Rectory, Saffron Hill, London, E.C., July 12th, 1900.

THE NEED FOR REFORM IN DEATH REGISTRATION.

To the Editors of THE LANCET.

SIRS,—A few weeks ago the vestry of Plumstead addressed a letter to the Westminster vestry informing them that in the Plumstead registration district almost 3·5 per cent. of the deaths were uncertified either by a medical practitioner or by a coroner. As this seemed a large percentage of uncertified deaths in one district alone I took some trouble in finding out how the law stands at present and how its provisions are carried out. At the outset I was appalled to discover that it is apparently

not necessary for the cause of death to be certified by a medical practitioner or by a coroner. In fact, it seems fairly clear that all the law demands is *registration* and not *certification*, and that the act of registration without certification is made easy in some districts and difficult in others. The act of registration is performed by the registrar, who need not necessarily have information either from a medical practitioner or a coroner, but can register a death on the information of a layman present at the death—"a qualified informant"—if he has no reason to suppose that the death was due to violence or accident or occurred under suspicious circumstances. These last must be referred to the coroner.

A Committee of the House of Commons was in 1893 appointed to consider the question and amongst other recommendations the following is particularly noticeable: "Your Committee ..... have come to the conclusion that uncertified deaths should as a class cease to exist and that means should be devised whereby a medical certificate should be obtained in every case not certified by a registered medical practitioner in attendance." The reason given for this is that there is no uniformity of practice amongst registrars and that in some districts cases are registered which in others would be referred to the coroner. Most uncertified deaths occur amongst infants and especially amongst illegitimate children, and it is not difficult to see how, in the case of infants, registration without certification makes murder easy. From the report of the Committee it is evident that uncertified deaths are on the whole diminishing steadily, but further examination of the figures shows that in some districts the percentage is still very large, and that it is extremely probable that under the existing law there will always be an irreducible minimum. To get rid of this quantity an alteration of the law is urgently necessary. The Committee recommended that a medical certifier should be appointed to make a personal inquiry into all uncertified deaths. They further recommended that he should be the medical officer of health, and probably their recommendation is the best one, though there are several reasons against it. The only other medical man likely to be appointed would be the police surgeon, but there would be in the public idea great sentimental opposition to a police surgeon inquiring into a cause of death. It would immediately create objection as implying suspicion of foul play. But whoever the certifier may be I am sure that he should not be allowed to perform a post-mortem examination without a coroner's order and that he should always send his report to the coroner, and that the latter should be, as now, the authority for determining whether an inquest should be held or not. That an alteration of the law is necessary has been asserted by a Committee of the House of Commons, whose recommendation has been approved by the London County Council, by the Society of Medical Officers of Health, and by the Coroners' Society.

I am, Sirs, yours faithfully,

Buckingham Gate, S.W., July 16th, 1900. H. A. DES VOEUX.

"THE COMPARATIVE GERMICIDAL ACTION OF SOME DISINFECTANTS."

To the Editors of THE LANCET.

SIRS,—I have read Mr. A. H. Burgess's article under the above heading in THE LANCET of June 23rd (p. 1797) with much interest and no little surprise. The results set forth in the article are of such an extraordinary nature and so altogether opposed to those obtained by myself when working with many of the same disinfectants that I feel constrained to express considerable doubt in the efficiency of the *thread method* as employed by Mr. Burgess. This method was condemned as long ago as 1890 by Dr. V. von Gerlach. Commenting on the results obtained by Rideal and Walker, Chamberland and Fernbach, Rideal and Sugg when estimating the comparative value of certain preparations of phenol and cresols—in *solution* and *emulsion*—Von Gerlach states that he suspended threads in solutions and emulsions of phenoloids for an hour, after which he hung them for another hour in about 400 cubic centimetres of water, at the expiration of which time the threads which had been suspended in the emulsions "smelt plainly of the disinfectant," and that he "had to ascribe absence of growth in the gelatin to insufficient washing of the threads, *as subsequent inoculation with vigorous cultures proved.*" From which it will be seen that when working with emulsions there must ever be a certain amount of doubt attaching to investigations carried out with this method, as an alternative to which I should like to recommend one I have employed in several thousands of experiments with most regular and consistent results. This method has the further advantage of being extremely simple. Briefly stated it is as follows. To a known volume of an active culture of the organism add an equal volume of the dilute disinfectant; shake and take sub-cultures in suitable media at definite intervals. Incubate for at least two days at 37° C. In practice I prefer to take five cubic centimetres of a 24-hours' blood-heat culture of the organism to five cubic centimetres of, say, 0·2 per cent. disinfectant. This reduces the percentage of the latter to 0·1. (I may add the disinfectants are allowed to act at a room temperature of about 15° C.) Sub-cultures are then taken every two and a half minutes up to 15 in tubes containing about 10 cubic centimetres of bouillon. No exception can be taken to this method as regards the introduction of disinfectant during inoculation. I have made careful weighings and find that any disinfectant in the bouillon tubes introduced with the "loopful" employed in inoculation is present in such an extreme state of dilution (1 in 6,000,000) as to be quite innocuous.

I am, Sirs, yours faithfully,

Clapham, S.W., July 14th. J. T. A. WALKER.

PADDLING IN THE SEA.

To the Editors of THE LANCET.

SIRS,—My object in writing is to try to do a good turn to the thousands of children who are now going to the seaside. For some reason or other paddling is very generally condemned by the medical profession. My own experience, extending over some 30 years, is that the practice is most beneficial. The children love it and a child who has once paddled, when at the seaside always craves to do it again. I have no idea on what grounds the medical objection is based, but for some reason or other the prohibition is strongly impressed on the parents. The parents think the cold water to the feet sends the blood to the head, and believe that the hot sun on the head and the cold water to the feet are injurious. No doubt the same blood which is cooled in the legs is circulating through the brain and certainly the children's legs are red after paddling, so I suppose if it does anything it what people call "draws blood" to the legs and tends to prevent congestion elsewhere. A child on a very hot day is fretting and sweating, but a child paddling on such a day is perfectly happy and does not feel the heat. There is certainly no undue fatigue in standing, walking, or trotting about in the shallow water. Paddling seems a trivial subject for a letter in THE LANCET, but I am so convinced that it does the children good that I trust this may get inserted.

I am, Sirs, yours faithfully,

WM. KNIGHT TREVES, F.R.C.S. Eng.

Margate, July 12th, 1900.

THE JOINT COMMITTEE TO OPPOSE MIDWIVES REGISTRATION: AN APPEAL FOR FUNDS.

To the Editors of THE LANCET.

SIRS,—I have been directed to request the favour of space and permission to appeal to the readers of THE LANCET for donations to the voluntary fund to carry on the work of this committee. Its operations thus far have, on very limited resources, been most successful, being based on the broad principle of maintaining the rights of the profession as essential to the public welfare. Memorials to Members of Parliament have been well signed in large and important centres, and signatories have besides given letters introducing the representative of my committee, who has thus obtained personal interviews with about 20 and correspondence with over 30 Members of Parliament on the influential introduction of electors. Of these the most successful were the memorials and introductions of Mr. Griffith-Boscawen's medical constituents, securing his valued support, serviceable motion to consider the Bill "upon this day three months," and admirable speech imparting a new and improved tone to the debate.

Although the Bill is probably dead for this session very vigorous action is necessary in the constituencies to rouse

medical electors to bring home to Members of Parliament the real nature and grave danger of the proposed recognition of midwives by law to render *medical services* in labour. The registration of midwifery or monthly nurses is not opposed. The distinction taken is that diagnosis of presentation and conditions in labour is a difficult and highly responsible medical service which can be safely entrusted only to medical skill and knowledge. This my committee finds Members of Parliament readily grasp A medical Parliamentary division has been formed at Lewisham for local medico-political work. For the extension and organisation of our work in Parliamentary divisions funds are urgently required. About £30 have been expended, but to carry out our procedure throughout England and Wales at least £200 are needed.

Donations may be sent to the honorary treasurer, Dr. F. Lorimer Hart, Kirkdale, Sydenham, S.E., and further information may be obtained from the honorary secretaries, Mr. R. B. Anderson, and Mr. S. R. Russell Matthews, at the secretarial address, 32, Montague-place, London, W.C.

I am, Sirs, yours faithfully,

July 18th, 1900. F. S. TOOGOOD, M.D. Lond., Chairman.

"THE NATIONALISATION OF TRINITY COLLEGE, DUBLIN."

To the Editors of THE LANCET.

SIRS,—The controversy in THE LANCET on the above subject will, I feel sure, have convinced your readers not only that Irish university education is a difficult and thorny question, but that it is futile to put forward "the nationalisation of Trinity College, Dublin," as a settlement of it until there is some agreement as to what this phrase really means.

Your correspondent "A.M., M.D. Dub. University," says that what he understands as "The Nationalisation of Trinity College, Dublin," is its "desectarianising" *plus* the removal and endowment of its divinity school. On the other hand, I hold that the "complete desectarianising" of Trinity College will not make it a "national" university or college. To "nationalise" a university or college you must have among its governing body—professors, Fellows, and officials—representatives of all classes and creeds. Irish Roman Catholics and Presbyterians must have a fair share in its government and administration; the other existing colleges in Ireland must have their claims duly recognised; and, finally, the degrees of a "nationalised" university must be thrown open freely to the members of both sexes.

Now, Sirs, suppose—to look at the question from a practical point of view—a statesman of either of the great political parties adopts as the solution of the Irish University question, "the nationalisation of Trinity College, Dublin," in the narrow sense recommended by your correspondent, and brings forward such a measure in Parliament. He will soon find that he will be opposed, as indeed "A.M., M.D. Dub. University" freely admits, by the authorities of Dublin University; the Presbyterians of Ireland (who number 446,687) would not accept such a solution of the question because they would have no adequate representation on the governing body; the other colleges in Ireland would be up in arms against such a scheme, fearing their extinction; the Irish Roman Catholics would also decline to accept such a settlement; and women of all political parties would protest against the establishment of any new, or the rearrangement of any old, university unless all its degrees were open to their sex. No statesman, not even "a Government endowed with a backbone" (to quote your correspondent) could overcome such opposition. If, on the other hand, the statesman would propose as his measure the more thorough nationalisation of Trinity College, Dublin, such a scheme as I have foreshadowed, it would be opposed even more fiercely by the authorities of Trinity College, and I am sure it would not satisfy the demands of the Roman Catholic hierarchy in Ireland, and so the statesman after such unfortunate experiences would be compelled to agree with your original view—"the proposal to nationalise Trinity College is therefore as useless as it is impracticable"—while, I may be allowed to add in conclusion, adopting the classical diction of "A.M., M.D., Dub. University," no one "outside the walls of a lunatic asylum" would put forward as the settlement of Irish University education any form of "nationalisation of Trinity College, Dublin."

I am, Sirs, yours faithfully,

July 17th. IRISH GRADUATE.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

The Liverpool School of Tropical Medicine: Official Recognition by the Government.

THE Liverpool School of Tropical Medicine, which had only received partial recognition, has now been fully recognised by the Government as a training school for medical men proceeding to the colonies to take up Government appointments. Mr. Chamberlain, in a complimentary letter recently addressed to Mr. Alfred L. Jones, the chairman of the school, expressed his appreciation of the admirable work which is being done by the school, together with his cordial good wishes for the success of the new expedition in connexion with the school which had recently sailed for the region of the Amazon. Mr. Chamberlain concluded a flattering letter by intimating that the steps necessary to give effect to his decision will be taken at an early date. Lord Salisbury has also informed Mr. Alfred Jones that all medical officers proceeding to the African protectorates under the administration of the Foreign Office will be required to undergo a course of instruction for two months, either at the London or the Liverpool school of tropical medicine. The enterprise and public spirit shown by the Liverpool School of Tropical Medicine in the despatch within 12 months of three expeditions to the tropics for the elucidation of the causes of malaria, dysentery, and yellow fever, fully entitled it to official recognition by Government (in conjunction with the London School of Tropical Medicine) as a training school for colonial medical officers. Liverpool is to be congratulated on the position which its school of tropical medicine will now take in the world, and there can be no doubt that, with such an auspicious beginning, it will go on and prosper.

Liverpool Stanley Hospital.

The vacancy on the staff of physicians at the Stanley Hospital, through the resignation of Dr. C. J. Macalister, has been filled by the appointment of Dr. R. J. Buchanan, assistant physician. Dr. Buchanan had a successful career at the medical school of University College, Liverpool, and his promotion to the higher post at the Stanley Hospital is fully endorsed by his professional brethren. The method of election in the matter of proxies was taken exception to by the other candidates, and there can be no doubt that the system ought to be abolished. The electorate at this hospital is cumbersome, consisting of some hundreds of subscribers of one guinea and upwards, so that here also there is room for an improved method of election to the higher medical posts.

The Joint Parochial Hospital for Tuberculosis.

The joint committee of the unions of Liverpool, West Derby, and Toxteth Park have decided to purchase land at Heswall for the erection of the joint parochial hospital for tuberculosis at a cost of about £4200. The site of the new hospital is a pleasant plot of land on the slope of the hill overlooking the river Dee and the distant Welsh mountains. Mr. C. H. Lancaster has been appointed the architect and he is now engaged on the plans of the proposed building.

Low Death-rate in Liverpool.

The medical officer of health reports the interesting fact that there were 64 deaths less during the week ending July 7th than in the corresponding week of last year, the rate of mortality being 18·2 per 1000 of the inhabitants as compared with 23·2 per 1000 at the same period of last year, when there were 299 deaths.

Liverpool Country Hospital for the Chronic Diseases of Children.

The garden fête which was held last week at Woolton Wood, the residence of Mr. Holbrook Gaskell, in aid of the funds for the proposed Country Hospital for the Chronic Diseases of Children realised £528 2*s.* 6*d.* The institution, which commenced work in November, 1899, has a temporary home in the Children's Convalescent Institution at West Kirby, in which 20 beds were placed at the disposal of the committee at an annual rental. Mr. Holbrook Gaskell announced his intention of giving a second donation of £1000, whilst Mr. Andrew Gibson promised £500 towards the purchase of the new site. These donations are in addition to those already announced in THE LANCET.

The Heath Essay of the University of Durham.

The Heath Scholarship of the value of £200 has been

awarded to Dr. Nathan Raw, medical superintendent of the Mill-road Infirmary, Liverpool, and Major J. R. Dodd, R.A.M.C. The Heath Essay, which was founded by the late Professor Heath, is awarded every two years to graduates of the University of Durham. The subject of the essay for this year was "The Urinary Tract, its Injuries and Surgical Diseases, their Pathology, Diagnosis, and Treatment." Dr. Raw has also recently been elected a Fellow of the Royal Society of Edinburgh for his valuable contributions on the subject of tuberculosis with which his name has become identified in Liverpool. It is an interesting fact that the Heath Scholarship was awarded four years ago to Mr. G. P. Newbolt of Liverpool.

Death of Mr. Nicholas Smith Glazebrook.

Mr. N. S. Glazebrook, M.R.C.S., L.S.A., died at his residence, Hayman's-green, West Derby, on July 14th, in his eighty-eighth year. The deceased was at one time one of the best-known practitioners in the suburbs of Liverpool. He was closely associated with the public life of Liverpool in many of its phases, and for many years was a member of the West Derby Local Board. The deceased's eldest son is the Director of the National Physical Laboratories and was for some time the principal of University College, Liverpool—Mr. Richard Tetley Glazebrook, M.A., F.R.S. The interment took place on July 17th, at the parish church, Knotty Ash, amidst universal demonstrations of public respect.

July 17th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Edinburgh University Court.

AT a meeting of the Edinburgh University Court held on July 16th it was intimated that the Court's Ordinance No. 1 (Separation of the Teaching of Medical Jurisprudence or Forensic Medicine and Public Health in the University of Edinburgh) had been approved by Her Majesty in Council and that therefore the ordinance would come into force as from Oct. 1st next. Various grants were made from the Earl of Moray's endowment for purposes of original research, the recipients being Professor E. A. Schäfer, Dr. Alfred C. Sandstein, Dr. H. E. Gibbs, Dr. John S. Flett, Dr. J. Wilson Dougal, Dr. Evan H. Fraser, and Dr. Sutherland Simpson. Recognition was again granted to the Edinburgh Medical College for Women for the ensuing year.

Farewell Banquet to Sir William T. Gairdner.

On the occasion of Sir William T. Gairdner leaving Glasgow to reside in Edinburgh a considerable number of his medical and other friends entertained him to a banquet in the Windsor Hotel. In replying to the toast of the "Guest of the evening" in a pleasing and excellent speech Sir William Gairdner remarked that he had lived for 38 years before he was professor and 38 years after he had been appointed to a chair in Glasgow University, and that the two things he had ever asked for in life were his wife and his professorship. All the rest had come to him in spite of himself.

Health of Aberdeen.

Last week there were 38 cases of whooping-cough and 33 of measles reported to the medical officer of health, there being an increase in the number of cases of measles.

Thomson Medical Bursaries, Aberdeen University.

In consequence of the fall in the rate of interest the Senatus has been compelled to resolve that in future there shall under this foundation be three bursaries of £22 each, three of £20 each, and three of £18 each instead of six of £24 10*s.* each and three of £20 each, as hitherto.

July 17th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Belfast Workhouse.

THE Belfast Board of Guardians have in committee drawn up a report in reply to the scathing letter of the Local Government Board, which is a piece of ingenious special pleading. They admit that there has been a technical breach of the regulations, but they say that the irregular expenditure was upon necessary works; they are convinced that the best value was obtained for every penny, and that a large proportion of the outlay was incurred in connexion with the infirmary in carrying out repairs recommended by the Local Government Board, and of such a nature that they had to be carried out piecemeal and were unsuitable for contract. To break rules and then offer as an excuse that such irregularities are "technical" will not satisfy the Local Government Board. The guardians, had they been alive to their duties, ought surely to have been aware of such irregularities and in future the Belfast public will hold them responsible if they do not exercise a proper supervision over the official management of the institution. A discussion which took place on June 26th in reference to the salary of the new master does not tend to secure the confidence of the public. It was recommended in a report that this should be £250 per annum, and an amendment to make the sum £200 was only lost by the casting vote of the chairman. The proposed salary is much too low. Where can a man thoroughly versed in local government acts and in Poor-law procedure and who will manage the largest workhouse in the three kingdoms with over 3000 inmates be procured at this sum? A master of such an institution—a small town, in fact—whom every official and inmate would respect cannot be secured at such a paltry salary. This "penny-wise-and-pound-foolish" policy will only tend to incompetency and further mismanagement.

The Royal Victoria Hospital, Belfast.

From a report of the Working-men's Committee read at their annual visit to the Throne Convalescent Hospital on June 30th it appears that for the 16 months ending Dec. 31st, 1899, the sum of £3429 8*s.* 8*d.* was subscribed by the working-classes, this being the largest amount received from this source since the Working-men's Committee was formed 13 years ago. During the past 16 months 34,320 extern and 3255 intern patients have been treated at the Royal Victoria Hospital. The report concluded with the special thanks of the working-classes of the city to the medical and surgical staff of the hospital (as well as to the nurses) for the very efficient and gratuitous services rendered to the patients under their care.

Bangor District Nursing Society.

The annual meeting of this society was held under the chairmanship of the Marquis of Dufferin and Ava on June 26th. The report stated that the district nurse had attended 450 cases and had paid over 11,000 visits. There was a balance in the hands of the treasurer of £10 4*s.* 1*d.* An interesting speech was delivered by Lord Dufferin, to whom, as well as Lady Dufferin, the success of the society is largely due.

The Epidemic of Typhoid Fever in Belfast.

At a meeting of the Belfast City Council on July 2nd an animated discussion took place in reference to the outbreak of typhoid fever. Dr. H. Whitaker, medical officer of health of the city, reported that between May 20th and June 16th, 1900, 227 cases of typhoid had been notified and there had been 37 deaths. In the corresponding period of last year 152 cases of typhoid were reported with only 18 deaths. The discussion resolved itself far too much into a question as to whether it was the water or the sewage which was at fault in the outbreak, and as to the relative responsibilities of the city council and of the water commissioners. Very strong statements were made by some of the members of the city council as to the insanitary state of the streets, while equally incriminating remarks were made as to the water. By this line of discussion, however, no progress is made, and the Lord Mayor, who is a very practical man of business, said that if the water was bad the city council could bring the matter under the notice of the Local Government Board which could order an inquiry, and, he added, the Stoneyford water "had been subjected to the examination of the best analysts, and while they had not declared that it was a first-class water they found that it was a safe, healthy, and sound water." Finally, at the suggestion of the Lord Mayor, it was arranged that the Improvement and Public Health Committee should be instructed to consider the question of the health of the city, with the view of seeing what better provision could be made to improve it, and to report at an early date. The city surveyor has prepared an elaborate scheme for the bacterial treatment of the main drainage sewage which is at present emptied into the

Belfast Lough and which causes so much annoyance to the inhabitants living on each side of that estuary. To carry this plan out the Local Government Board will have to approve the works and to sanction the borrowing of £80,000 for their execution. It was decided, after a long discussion, to refer the matter to the council in committee and to employ a specialist to report on it.

A joint committee, formed of members of the Public Health Committee and Improvement Committee of Belfast who were appointed to consider the question of the health of the city and how it could be improved, with special reference to typhoid fever, has instructed the executive sanitary officer and the city surveyor to prepare reports on this important matter. The former recommends (1) that the sewers and drains be more efficiently cleansed, ventilated, and flushed; (2) that old courts, alleys, and back passages, and drains connected therewith, be flushed out; (3) that sewer atmosphere generated in the main drains be prevented from rising to the main levels of the city; (4) that the milk-supply of the city be more effectively controlled; (5) that the sale of shell-fish from Belfast Lough be prohibited within the city; (6) that a sufficient number of officers be provided for drain-testing (it is impossible for two officers, as at present, to do this duty for 71,000 houses); (7) that the domestic scavenging of Belfast be improved; and (8) that pollution of streams in the city be prevented, as was recommended in a report on Nov. 9th. These precautions, it is thought, will keep down the normal rate of typhoid fever (the endemic disease), but the executive sanitary officer reports that there will be no protection against epidemics of the disease until the Water Commissioners carry out the powers which they obtained from Parliament last year, when, in referring to their catchment, the chief engineer of that trust stated that "a condition of things like that on the catchment is a standing menace to the health and life of the people in the town where the water is consumed." The city surveyor agrees with these recommendations of the executive sanitary officer and adds suggestions as to structural improvements in the present sewage system of the city of Belfast. He advises more ventilation in many of the sewers and that arrangements be made that some of the higher parts of the city should not have more than their due share of discharge of sewer-gas as at present. He advises improved modern sewers for the old, leaky, and defective ones, more facilities for flushing sewers and house-drains, the use of the water-pressure test for the drains of all houses built on "filled-in" ground, and that "concreting" and "asphalting" should be required on all doubtful or "filled-in" sites.

The Illuminating Gas-supply of Dublin.

The alarm caused many months ago by the letter from Professor J. Emerson Reynolds warning gas consumers of the fact that the amount of the poisonous ingredient carbonic oxide had been much increased in the town gas has not been allayed by any definite statement from the Alliance Company. At the last meeting of the Dublin Sanitary Association an important discussion took place on the subject, and it was alleged that the ordinary coal-gas in use in Dublin up to February last, containing about 6 per cent. of carbon monoxide (such as seems to be unavoidable), was now replaced by a mixture of coal and water-gas containing as much as 17·9 per cent., indicating a mixture of about 40 per cent. of water-gas. The Alliance and Dublin Gas Consumers Company has long held a complete monopoly of our gas-lighting as an independent company outside the control of the municipal authorities or corporation. Their delay in affording any definite information available to the public as to the quality of the illuminant which they supply has naturally given much dissatisfaction, for it is alleged that many of their iron conduits for gas are old and so corroded as to allow of considerable leakage. The electric light cannot be widely used owing to the comparative failure of the corporation installation, and but very few private houses in Dublin are now supplied with it. There seems, moreover, but a poor prospect of their obtaining it for a long period, the corporation having quite recently succeeded in having the Bill of a private electric light company who proposed to supply it thrown out in the House of Commons. The citizens have much to complain of in this regard. They practically cannot get the modern and clean electric illuminant and they are forced to depend upon a gas mixture the precise nature of which is concealed. The price of this gas has recently been lowered to 3*s.* 4*d.* per 1000 feet, but even this figure does not compare favourably with the expense of gas in other towns.

Coroner for Ballymoney District.

At a meeting of the Antrim County Council held on July 10th Mr. J. C. Woodside of Ballycastle was appointed coroner for the Ballymoney district in the room of the late Dr. Carnac.

The Water-supply of Belfast.

For some time a good deal of discussion has been raised in Belfast in reference to our water-supply, especially as some people believe the present catchment areas may be in part, owing to their contamination, the cause of the present outbreak of typhoid fever, and this has been brought home still more to the public by the fact that the officer of health of the city has publicly advised that all water used for domestic purposes should be boiled. We are promised a new supply from the Mourne mountains, but even in reference to it some curious statements have been made; and hence, to clear up all doubts, an interviewer of one of the city papers has put the whole matter before the chairman of the Works Committee of the Water Board, and as a result a great deal of authentic information has been placed in the hands of the people of Belfast. The reason why the Water Commissioners have built the conduit first and have left the storage reservoirs to be constructed afterwards is that by taking them separately they will save expense, and also because by taking the water direct from the Kilkeel river and the Annalong river, through the help of weirs, a supply of water can be obtained in a short time. The present catchment areas—Woodburn and Stoneyford, which have cost £700,000—give 11,500,000 gallons per diem all the year round, and just now 13,000,000 gallons are the daily consumption. The present wet summer saved matters this year, but another summer cannot be faced without an additional supply, and if the city of Belfast increases as it has done since 1894 in seven years hence 16,000,000 or 17,000,000 gallons per diem will be needed. It is hoped that between April and July from 2,000,000 to 3,000,000 gallons per day may be obtained from these rivers at Kilkeel, and during the other eight months 10,000,000 gallons per diem. Whether there will be such a supply or whether the water will be quite clear of sediment or peat remains to be seen. It is hoped that before the end of this year this supply may be ready for use and for the present this water will be given to residents on the County Down side of the river Lagan which divides Belfast. By this means the strain on the Stoneyford and Woodburn supplies will be relieved, and then when the bridge is built to carry the mains across the river Lagan those living on the County Antrim side will also be supplied. The commissioners also propose to build simultaneously the new reservoirs in the Silent Valley at Kilkeel and the iron bridge across the river Lagan in Belfast; but in the meantime, by means of the conduit and the tapping of the Kilkeel and Annalong rivers, the city will be kept safe as far as a necessary supply of water is concerned. The reservoir dam at Kilkeel will cost a large sum—it may be a quarter of a million—as there is a deposit of sand and drift of unknown depth which will have to be cleared out. When this dam is finished 10,000,000 gallons per diem will come from Kilkeel and it is intended by this supply to add to, but not to supersede, the existing supplies from Woodburn and Stoneyford. When the whole new scheme is finished it will cost about £1,000,000, or about £100,000 per 1,000,000 gallons per day for 10,000,000 gallons of water.

New Medical Magistrate.

Dr. Henry O'Neill, surgeon to the Royal Hospital, Belfast, and a city councillor, has been made J.P. of the county of the city of Belfast.

July 17th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Cerebellar Abscess.

THIS condition, which is by no means common, was the subject of an important communication made to the Academy of Medicine by Professor Dieulafoy at a recent meeting. In his opinion cerebellar abscess is always consequent upon an otitis. Whether the otitis be acute or chronic and whether there be discharge or not matters little; once the cavity of the tympanum is infected the

organisms can exalt their virulence under most favourable conditions in the closed cavities of the antrum and the mastoid cells. From there they propagate themselves in different directions. The intra-cranial lesions consecutive to the various forms of otitis are many in number, such as cerebro-spinal meningitis, pachy-meningitis, phlebitis and thrombosis of the sinuses, cerebral and cerebellar abscesses. As a rule cerebellar abscess gives rise to the cerebellar group of symptoms, namely, occipital headache, ictus, loss of equilibrium, vertigo, staggering, vomiting, nystagmus, cervical contraction, optic neuritis, muscular asthenia, and a torpid condition bordering upon coma. These symptoms make up the cerebellar *syndrome* in its purity and are found whether the lesion be in the right lobe, in the left lobe, or in the vermiform process. If two other symptoms—namely, facial paralysis and paralysis of the external ocular motor nerve—are present the lesion can be assigned to one in either lobe. This was the case in a patient under the care of Professor Dieulafoy. The cerebellar *syndrome* closely resembles the auricular or labyrinthine *syndrome*. The following are points of difference for the purposes of diagnosis. Labyrinthine headache is not so severe or so persistent nor is it in the same place as that due to cerebellar mischief, while the drowsiness and torpor which increase from day to day in cerebellar mischief do not appear in labyrinthine disease. Abscess of the cerebellum has to be distinguished from abscess of the cerebrum situated in the temporo-sphenoidal or occipital lobes. In a cerebral abscess the motor disturbances, whether paralysis, contraction, or spasm, are situated on the opposite side to the lesion or the otitis, and disturbances of speech and hemianopsia are two important symptoms. Tumours of the cerebellum, such as glioma, gliosarcoma, tubercle, and parasitic tumours, also give rise to the cerebellar *syndrome*, but it is not so well marked in the case of a tumour, owing to these giving rise to other symptoms attributable to their growth. Cerebellar syphilis stands upon a different plane both as regards diagnosis and treatment. Surgical intervention at the right time is the only treatment for cerebellar abscess. At the same meeting M. Laborde showed various animals, such as cats and guinea-pigs, in which different intra-cerebellar lesions had been brought about. In these the cerebellar group of symptoms was complete—cervical contraction, muscular weakness, and rotation in the long axis towards the same side as the lesion. Experimental reproduction of pathological lesions was thus complete.

Medical Tours to French Mineral Springs.

Last year Dr. Carron of La Carrière organised under the patronage of M. Brouardel, M. Landouzy, M. Cornil, M. Fournier, and M. Huchard a system of tours intended to combine instruction and pleasure and the object of which was to enable medical men and medical students, both French and foreign, to make themselves practically acquainted with the French health resorts. Last year the tour consisted of visits to the places in the central districts and Auvergne. This year the tour will be to the Pyrenees and the south-west districts. Luchon is the starting-place and thence the party will visit Capverne, Bagnères de Bigorre, Argelès, Barèges, Saint Sauveur, Cauterets, Pau, Saint Christau, Eaux Bonnes, Eaux Chaudes, Salies de Béarn, Biarritz, Cambo, the Sanatorium at Hendaye, and Dax and Arcachon. As was the case last year Professor Landouzy, the scientific head of the expedition, will deliver lectures upon the properties of, and the therapeutic indications for, the use of the different places.

Completion of the Faculty of Medicine.

In view of the forthcoming International Congress of Medicine and also the Congress of the Medical Press most of the medical institutions in Paris are getting ready for the reception of visitors. I have already described the hospital alongside of the Pasteur Institute. The new Academy of Medicine will, unfortunately, not be ready in time but the Faculty of Medicine is quite ready. The works have been going on for 23 years and were at a standstill for a space of six years. Work was recommenced in 1898 with the large wing in the Rue Hautefeuille. This is now just open and includes a magnificent vestibule opening upon the interior quadrangle of the faculty and ending at the great staircase of the library. On the first floor are large examination rooms, waiting rooms, and a spacious common room for the different professors. This is ornamented with busts of distinguished physicians and surgeons, while the walls are hung with the magnificent Gobelins tapestry which was presented to the old school of surgery, which occupied the present site of the Faculty of Medicine, by Louis XV. While the works were in progress the architect came across the foundation-stone of the old school of surgery, still bearing its bronze plate upon which were inscribed the details of the former ceremony of inauguration. Only recently, too, a subsidence in the courtyard revealed the cellars of the old Franciscan convent which formerly existed on this site, and the chapel of which, used as an examination room, was only pulled down during the progress of the present works.

Sanitary Instructions for the Troops going to China.

The Minister of Marine has issued an excellent circular for the troops who, in increasing numbers, are daily starting for China. The circular deals with the climatology of Northern China and gives details as to water, food, and other points of vital importance for the well-being of the troops. Next week I shall lay some further details before your readers.

The Culture of Gonococci in Gelatinised Blood.

Everybody knows the difficulties which are experienced in cultivating gonococci in the usual culture mediums employed in the laboratory. A great step in advance has been taken and was described in a report which M. F. Bezançon and M. F. Griffon recently laid before the Society of Biology. These observers found that blood mixed with gelose made an admirable medium for the culture of gonococci. Tubes of this material infected with gonorrheal pus showed at the end of about 24 hours in a temperature of 37° C. numerous round flat transparent colonies of variable dimensions. If these colonies were examined at the end of the first 24 hours the microbes appeared under their characteristic forms and not as misshapen granules as is the case with other methods of culture. The cocci survive for a considerable time and in one tube the observers were able to preserve the organisms alive for a period of six months. This peculiarity, together with the advantages resulting from the early growths of the colonies and the marked morphological characteristics of the microbes which appear by this method, make it an eminently practical one for the culture of this organism.

July 17th.

Obituary.

BENJAMIN HOWARD, M.A., M.D. NEW YORK, M.R.C.S. ENG., F.R.C.S. EDIN.

THE death is announced, in his sixty-fourth year, of Dr. Benjamin Howard of New York. He had been ill for some months, suffering from nephritis. He died at the country house of his old friend, Dr. Andrew H. Smith of Elberon, New Jersey, where he spent the last few weeks of his life. Dr. Howard was born in 1836 and studied medicine in Paris, Vienna, and Berlin, as well as in New York. In 1858 he graduated as M.D. of the University of New York, serving through the Civil War as an assistant surgeon. He afterwards held the posts of professor of surgery and surgeon to Long Island College Hospital, New York State, and of lecturer upon operative surgery in the Medical Department of the University of New York. He was also professor of surgery in the University of Vermont. A frequent visitor to this country, he became a Member of the Royal College of Surgeons of England in 1877 and a year or two later a Fellow of the Royal College of Surgeons of Edinburgh. He was deeply interested in the study of methods for artificial respiration, and having come to the conclusion that there were faults both of omission and commission in the respective methods of Marshall Hall and Silvester he devised a method of his own called the "direct" method, which he demonstrated at a clinical lecture at King's College Hospital on July 7th, 1877.[1]

A supplement to this lecture, giving the method in more detail, was published by Dr. Howard in THE LANCET of May 25th, 1878, p. 748. The outcome of these demonstrations was that a committee of the Royal Medical and Chirurgical Society was appointed to report upon the methods adopted by the Royal Humane Society (which, to put it shortly, combined Marshall Hall's method of removing fluid with Silvester's method of respiration) and that recommended by Dr. Howard. The result of the preliminary report was to show that no one method could be said to be the best, but that a combination of the three would probably be superior to

[1] THE LANCET, August 11th, 1877, p. 194.

any one.[2] Another subject in which Dr. Howard took an abiding interest was that of ambulances for large towns. His attention had been first drawn to the matter when on the battlefield of Antietam he had suddenly become responsible for the ambulance service there. London, as he said in his paper upon the subject read before the Medical Society of London, is a *quasi*-battlefield[3] and needs an efficient ambulance service. 18 years have elapsed and we are but little better off than before in the way of horse ambulances, although owing to Dr. Howard's efforts a meeting was held to consider the matter, when the general hospitals were represented and the Duke of Cambridge was in the chair. Still, at page 119 of our issue of July 14th will be found an annotation stating that a scheme formulated by Mr. S. Osborn, F.R.C.S., for the establishment of an ambulance system for London is before the London County Council. Therefore it seems probable that coincidently with Dr. Howard's death steps are at length being taken to bring about the fulfilment of the object he so ardently desired.

GEORGE SAMUEL GREGORY, M.R.C.S., L.S.A.

MR. BRUDENELL CARTER writes: "The death, on July 9th, in his eighty-eighth year, of Mr. George Samuel Gregory removes from the ranks of the medical profession not only one of its oldest, but also one of its most accomplished members. Mr. Gregory obtained his qualifications in 1835, and, after a period of practice in London, and some time spent in travelling, much of it in Spain during the Carlist war, settled at Pewsey, in Wiltshire, but removed in 1848 to Stroud in Gloucestershire, where he conducted an extensive practice for 35 years and was also certifying surgeon under the Factories Act for the district. He retired in October, 1883, and resided first in Bloomsbury and for the last three years in Kensington, able until the 13th of June to take almost daily walking exercise, and to enjoy the society of his friends. On the 14th of June he suffered from a cerebral hæmorrhage, producing left-sided paralysis, and he passed quietly away on the 9th of July. Mr. Gregory was not only a remarkably skilful and successful practitioner, but was also a man of very unusual attainments in various ways. A fair mathematician, a clever mechanic, a good scholar, and an accomplished linguist, he was deeply read in many directions, especially in dogmatic theology and in the mental philosophy of the earlier portion of the century. He was a learned art critic, an amateur architect of no mean ability, had designed most of the furniture of his pretty house at Stroud, and was a most successful gardener, especially in the cultivation of the cyclamen. A keen observer of men and manners, with a retentive memory and a great command of picturesque and telling language, he was an animated and brilliant talker, and was frequently visited at Stroud by men who had attained celebrity in different walks of life. Wilkie Collins wrote much of "The Woman in White" while staying with Mr. Gregory, and gathered the names of some of the characters from tombstones in neighbouring churchyards. Another of his intimate friends was the late Mr. St. John Mivart, F.R.S., and another was Mr. Frank Dicksee, R.A., some of whose early work still adorns the house at Stroud. Although a bachelor, and not altogether free from a tendency to criticise the foibles of the opposite sex, he was conspicuous for his old-fashioned and graceful courtesy to women, and was a very general favourite with them. There could perhaps be no better evidence of his sterling and loveable character than the fact that among those who stood around his grave there were three men of different callings who were united to him by ties of close and uninterrupted friendship which had existed, in the case of the writer for 38, in another for 48, and in the third for 60 years."

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. James T. Whittaker, Professor of Medicine in the Ohio Medical College, Cincinnati.—Dr. A. Schetelig of Nervi, whose researches on archæological subjects are well known. He was in early life assistant to Professor Esmarch of Kiel and during the Franco-German war was in charge of the Hamburg Red Cross Ambulance at Metz.

[2] THE LANCET, Nov. 1st, 1879, p. 659.
[3] THE LANCET, Feb. 4th, 1882, p. 172.

Medical News.

UNIVERSITY OF OXFORD.—The following candidates at examinations for the degree of Bachelor of Medicine, Trinity Term, were successful in the subjects indicated:—

FIRST EXAMINATION.

1. *Organic Chemistry.*—George Basil Doyne Adams, Christ Church; Owen Alfred Rowland Berkeley-Hill, Trinity College; George Henry Crosfield and Turner Henderson, University College; Reginald Jamison, Trinity College; William Herbert Lee, Balliol College; Cuthbert Taunton Raikes, Trinity College; and Charles Joseph Singer, Magdalen College.
2. *Materia Medica and Pharmacy.*—Launcelot Toke Burra, University College; Edward Burstal, Trinity College; Henry Roy Dean, New College; Gerald Edward Friend, Keble College; Reginald Charles Jewesbury, Christ Church; James Edmund Rutherfurd, Corpus Christi College; Arnold Shelley, Keble College; Charles Joseph Singer, Magdalen College; and Cyril Aubrey Smallhorn, Wadham College.
3. *Human Anatomy and Human Physiology.*—Philip Edward Homer Adams, Exeter College; Edward Frederic Beaumont,* Wadham College; John Martin Bickerton, Merton College; Walter Brinsmead Billinghurst, St. John's College; William Edward Blackall,* non-collegiate; William Leigh Maule Day, Exeter College; Harold Frankish, Worcester College; Arthur Frederick Hertz, Magdalen College; Dudley William Carmalt Jones, Corpus Christi College; Henry Wynyard Kaye, Magdalen College; Harold Lionel Laws, Wadham College; Richard Ernest Howell Leach, Merton College; Douglas Reginald Pike,* Jesus College; James Edmund Rutherfurd, Corpus Christi College; and Richard Harvey Sankey, Christ Church.

* Offer Human Anatomy only, being exempt from examination in Human Physiology.

SECOND EXAMINATION.

1. *Pathology.*—Arthur Edwin Boycott, B.A., Oriel College; Lawrence Henry Carr-Birkbeck, B.A., Trinity College; William Morris Gladstone Glanville, B.A., Christ Church; Edmund Henderson Hunt, B.A., Balliol College; Alfred Edward Arthur Loosely, B.A., Pembroke College; Reginald Cuthbert Mullins, B.A., Keble College; Lionel James Picton, B.A., Merton College; and Charles Ernest West, B.A., Balliol College.
2. *Remaining Subjects.*—Edmund Delafosse Bond, B.A., and Reginald Cuthbert Mullins, B.A., Keble College; John Davy Rolleston, B.A., Brasenose College; Albert Edward Thomas, B.A., Merton College; and Richard Warren, B.A., New College.

UNIVERSITY OF GLASGOW.—The following candidates have passed the final examinations for the following degrees:—

M.B., C.M.—John Lunn, Alexander M'Donald Nevin, John James Robertson, James Wallace Shane (old regulations), and Archibald Stevenson.

M.B., Ch.B.—Matthew Aikman, M.A., George Arthur, Gavin Barbour, Thomas Thomson Bathgate, James Freeborn Bennett,‡ Alexander Binning, Alexander Birch, Harry Egerton Brown, John Douglas Brownlie, Thomas Carruthers, M.A., Alexander Henderson Cassells, Edward Provan Cathcart,‡ Daisy Annabella Murdoch Clark, B.Sc., John Thomson Clark,‡ Robert Clark, Charles Campbell, Cuthbert, M.A.,† Archibald William Wallace Davidson,‡ Frank Lindsay Dickson, David Curr Douglas, John Pinkerton Duncan, B.Sc.,† Leonard Findlay,*† Alexander Fraser, M.A., Lizzie Thomson Fraser, Gilbert Garrey, David George Somerville Gartshore, William Gibson, Edward Gillespie, William Girvan, Helen Mary Gordon, Charles Aikman Gourlay, M.A.,‡ John Gracie, Charles Herbert Gunson, Archibald Wilson Harrington,‡ Isaac Mackay Huey, Thomas Inglis, Pierce Jones, William Bryce Kerr, James Dickson Laidlaw,* John Francis Lambie, Norman Maclean Leys,‡ James Dunlop Lickley,‡ Mary Forbes Liston, John Lockhart, Alexander Logan, David Longwill, Anderson Gray M'Kendrick,‡ James Mackinnon,‡ George Todd Maclean, M.A., Alfred Robert Maclurkin,‡ Burgess M'Phee,‡ Andrew Mair, Robert MacNab Marshall,‡ Allan Martin, M.A., B.Sc.,‡ James Millar, M.A., Ernest Wardlaw Milne, Alexander Robert Moir, Alexander Munro, William Barr Inglis Pollock, Robert Rennie, John Duncan Richmond, Margaret Mitchell Ritchie, David Russell, James Scott, M.A., Edgar William Sharp, James Shearer, David Ap Simon, Christian Cleland Wood Smith, James Johnston Smith, John Steele Smith, Andrew Stewart, Gertrude Florence Fleetwood Taylor, Robert Taylor, Thomas Bird Tierney, James Cameron Turnbull,† William Dinning Walker, George White, Morgan Watkin Williams, Alexander Wilson,*‡ Thomas Watson Wilson, and Hugh Patrick Wright.‡

* Surgery and Clinical Surgery.
† Practice of Medicine and Clinical Medicine. ‡ Midwifery.

FOREIGN UNIVERSITY INTELLIGENCE.—*Baltimore:* Dr. F. S. Cullen and Dr. W. W. Russell have been appointed Professors of Gynæcology in the Johns Hopkins University.—*Jena:* Dr. Friedrich Schultz has been promoted to an Extraordinary Professorship of Physiological Chemistry.—*Marburg:* Dr. Axenfeld of Rostock has been offered the chair of Ophthalmology.—*Montpellier:* Dr. Bosc has been appointed to the chair of Pathological Anatomy.—*St. Petersburg (Military Medical Academy):* Dr. A. Gerwer has been recognised as *privat-docent* of Neurology and Psychiatry.—*Strasburg:* Dr. Edwin Faust has been recognised as *privat-docent* of Pharmacology.—*Vienna:* Dr. Gustav Braun von Fernwald, Director of the Third Midwifery

and Gynæcological Clinic, a brother of the well-known gynæcologist, Professor Karl Braun, is about to retire, having reached his seventy-first year.

WATER CARRIAGE.—It is not often that attempts are made to go back to the old methods of dealing with excreta, but at a recent meeting of the Manchester City Council an alderman proposed the following motion:—"That in considering the plans of new buildings the Improvement and Buildings Committee be instructed not to insist upon the provision of water-closet accommodation, unless special circumstances render it desirable." His idea was that water should be carefully used until the laying of the second pipe from Thirlmere is completed, which will take three years. It was stated, however, that the effect of the present water-closet system on the water-supply was not appreciable. The motion was rejected.

THE HEATH SCHOLARSHIP.—The Heath Scholarship, value £200, which is awarded every two years by the University of Durham, has this year been awarded to Dr. Nathan Raw of Liverpool, and Major J. R. Dodd, R.A.M.C. The subject of the essay was, "The Urinary Tract, its Injuries and Surgical Diseases, their Pathology, Diagnosis, and Treatment."

THE ROYAL VETERINARY COLLEGE.—The Duke of Cambridge presided at the annual meeting of the Royal Veterinary College, of which he is president, on July 11th. The twenty-fifth annual report showed that during the financial year 1899-1900 59 students had entered the college, as compared with 66 last year. At the examinations held by the Royal College of Veterinary Surgeons in July last 73 per cent. of the students presenting themselves proved successful, while at the December examinations 66 per cent. passed. 70 per cent. of the 226 students of the college who presented themselves for examination during the year passed, while 66 per cent. of the 244 students who presented themselves for the same examination from the other veterinary colleges were successful. During the year 43 students obtained the diploma of the Royal College of Veterinary Surgeons, 32 students succeeded in passing the first professional examination, 43 the second, and 40 the third. In the research department complete or partial post-mortem examinations in 355 cases of disease had been made for members of the Royal Agricultural Society and for veterinary surgeons. The gratuitous supply of mallein to veterinary surgeons in private practice had been continued and the manufacture of tuberculin was begun in the early part of last year with a view of supplying the requirements of qualified members of the veterinary profession. The chairman of the governors, Sir Nigel Kingscote, stated that two investigations were being made at the college, one with regard to the reliability of tuberculin as a test for tuberculosis, towards which the Royal Agricultural Society had made a grant of £400, and the other into the cause of African "horse-sickness," towards which the War Office had given £200. Lord Egerton of Tatton was elected a vice-president in place of the late Duke of Westminster, and Lord Moreton and the Hon. W. F. D. Smith, M.P., were appointed governors.

ST. MARY'S HOSPITAL.—PRIZE AWARDS.—On July 13th Dr. T. Clifford Allbutt, Regius Professor of Physic in the University of Cambridge, distributed the prizes won by the students of St. Mary's Hospital. Dr. W. B. Cheadle presided.—Dr. H. A. Caley (the Dean), who read the report, which referred to the reconstitution of the University of London, said that the medical school had become one of the first schools of the London University. The medical school had upwards of 50 representatives with the Imperial forces in South Africa, and they had to deplore the deaths of Captain R. H. E. G. Holt, R.A.M.C., from wounds, and of Lieutenant G. W. G. Jones, R.A.M.C., from enteric fever, in Ladysmith, as well as of Lieutenant-Colonel A. Baird Douglas, a former student of the school, who was killed while in command of the 4th Battalion Sherwood Foresters at Roodeval. The record of academic distinctions for the year was high, notably at the University of Cambridge. In athletics the students had been remarkably successful. Important advances in the pathological department had been made during the year.—Professor Allbutt in distributing the prizes said that though Ruskin had said that the great achievement of modern education had been to teach people to think wrongly on every conceivable occasion he did not think that this applied to the education of the end of the nineteenth century. Nowadays students were taken through natural phenomena and taught to observe and to think, and the result was seen in the excellent work brought forward at examinations. There had been an extraordinary improvement in teaching and in the accessibility of knowledge, the tendency being to take the student away from the lecture-room into wards and laboratories. The process of verification thus instituted was most useful and was happily gaining ground.—On the motion of Sir W. Broadbent a vote of thanks was accorded to Professor Allbutt, and the usual courtesies to the chairman terminated the proceedings.

THE Victorian Convalescent Home for Surrey Women and the Duchess of Teck Memorial Home of Rest for Working Women were opened by the Duchess of York at Bognor on Monday, July 9th. The buildings are in the Renaissance style of architecture and fitted up according to the most modern improvements of sanitary science. The Victorian Convalescent Home is Surrey's memorial of Her Majesty's long and glorious reign, while the Duchess of Teck Memorial Home of Rest for Working Women is the nation's memorial to the late Princess Mary.

Parliamentary Intelligence.

HOUSE OF LORDS.

TUESDAY, JULY 17TH.

The Question of Death Certification.

LORD MONKSWELL called the attention of the Government to the report of the Select Committee of the House of Commons on Death Certification and asked whether they proposed to introduce legislation on the lines of the recommendations of the committee.—Lord HARRIS, replying for the Government, said that for some time the subject had engaged the attention of the President of the Local Government Board with a view to legislation. There were, however, a good many difficulties connected with it and Mr. Chaplin was at present having inquiry made by the officers of the department in the hope of overcoming these difficulties. Mr. Chaplin was in hopes that at no distant date he would be able to introduce a Bill on the subject.

HOUSE OF COMMONS.

THURSDAY, JULY 12TH.

Anti-typhoid Inoculation.

MR. BARTLEY asked the Under Secretary of State for War whether his attention had been called to a report from Dr. Conan Doyle on the Langman Hospital, South African Field Force, Bloemfontein, in which he stated that there had been no death from enteric fever up to June 5th from among the inoculated; whether the War Office had yet any official statistics on the results of inoculation; and whether any further efforts were being made to increase the number inoculated in men now going out to South Africa and China.—Mr. WYNDHAM replied: As I have already explained to the House the statistics at present available are not sufficient to enable me to give a reply to the first and second paragraphs of the question. Inoculation is offered to all men embarking from home for a country such as South Africa or China where enteric fever is prevalent, but such inoculation is purely voluntary.

FRIDAY, JULY 13TH.

Medical Acts Amendment Bill.

The Bill to strengthen the disciplinary powers of the General Medical Council to give universities and medical corporations power to withdraw their diplomas from practitioners whose names have been removed from the Medical Register because of misconduct, and to provide that fines and penalties recovered under the Medical Acts shall be paid to the treasurer of the General Medical Council, was introduced at this sitting by Sir Richard Jebb and formally read a first time, the order for the second reading being put down for Thursday, July 19th. The Bill is backed by Sir Richard Jebb, Sir William Anson, Mr. J. A. Campbell, Sir Michael Foster, Mr. Lecky, Mr. Talbot, and Sir John Batty Tuke, all of whom are university representatives.

Oil in Manufactured Tobacco.

The Chancellor of the Exchequer introduced a Bill to restrict the amount of oil in manufactured tobacco.

The Employment of Retired Army Medical Officers.

Mr. MACNEILL asked the Under Secretary of State for War if he could state what was the number of the retired army medical officers who were liable to be recalled to service, and of these gentlemen how many had been recalled to service since the outbreak of hostilities in the Transvaal, and how many were now with the field forces in South Africa or in hospitals at the bases.—Mr. WYNDHAM replied: There are 98 retired army medical officers liable to recall; of these 18 are holding permanent appointments reserved for officers on retired pay. The services of 25 others who volunteered to return to the service have been accepted and they have been employed at home and abroad. None have been recalled by compulsion. Four officers are employed in South Africa and on hospital ships.—Mr. MACNEILL asked: Then out of 98 officers on the retired list only four are employed in South Africa?—Mr. WYNDHAM replied: Yes. The 18 who are holding permanent appointments are officers of high rank and it is thought better to employ in South Africa young civilian doctors who have more recent experience of hospital work.

Lead and Phosphorus Poisoning.

These subjects were discussed at this sitting in Committee of Supply on the vote for the Home Office. Sir MATTHEW WHITE RIDLEY, in the course of his reply, said that with regard to lead poisoning in the earthenware manufactories in the Potteries although the improvement had been steady and substantial it had not been all that they could wish. Whether the figures were good or bad the fact remained that lead poisoning in the Potteries was a fearful thing and far more serious than phosphorus poisoning. He was, therefore, prepared to admit, on the part of the Home Office, that the case demanded the most urgent attention, and on their part they should do everything that they possibly could to secure that the industry should be carried on in a manner as little harmful as possible to those engaged in it. They had not been altogether idle in this matter. He admitted to the full that the existing code of rules was not sufficient, but it had done a considerable amount of good. They had been engaged on a new code of rules which would shortly be published and which he hoped would carry out substantially everything recommended by Dr. Oliver and Dr. Thorpe, with the exception that there was no absolute prohibition of the use of raw lead in every case. He had every hope that the rules would be accepted and he was almost confident that they would get them without arbitration, but he should go to arbitration rather than that the present state of things should continue. With reference to the case of the phosphorus special rules, which had already been debated this session, he was very much astonished to find that so many members took the view that the rules had really not been strengthened. There were one or two points in which the rules were weakened contrary to their desire, but he claimed for them in the first instance that they were drawn up in the main to carry out the recommendations of their experts. They were to a certain extent altered, but if those alterations were minutely examined it would be found that they were not really of that importance which some members attached to them. He did not know if he needed to go into them in detail, but to take, for instance, the distinction between the wet and the dry process. He could not say they were in a position to decide that they had the same positive evidence in regard to the injury in the one case as they had in the other. He was not prepared to admit that the rules regarding the matchmaking industry were weak or that they were not a considerable improvement upon the rules passed some years ago. There again he did not see how it was possible to prohibit absolutely the use of this particular kind of phosphorus. As the result of what had been done there had only been one case of necrosis reported in the past six months and the department had, to a large extent, got hold of the disease. The effect of the attention paid by manufacturers to the new process was that one large firm had abandoned altogether the use of dangerous phosphorus; and if it was possible to supply strike-anywhere matches as cheaply without the use of this dangerous stuff the public could do a great deal in encouraging its disuse. With regard to an international arrangement to do away with the use of white and yellow phosphorus, he feared that there was not much hope of it. As to the phosphorus trade, he hoped that those who had criticised the rules would test them by experience. If there were a loophole in them further action could be taken.

MONDAY, JULY 16TH.

Civil Surgeons in South Africa.

Mr. MACNEILL asked the Under Secretary of State for War if he could state the number of civil surgeons whose services had been accepted since the outbreak of hostilities in South Africa for the field hospitals and base hospitals, and the number of civil surgeons who were at present employed in these hospitals, and how many army medical officers within two years from their entrance into the Army Medical Service had been sent to the war in South Africa; whether his attention had been drawn to the fact that of 98 army medical officers who were liable to be recalled to service four only were employed in South Africa or in hospital ships, and that although many of them have requested to be sent to the seat of war their offers were refused; whether the authorities at the War Office were aware that the sending of army medical officers without previous experience in campaigns, and the recognition of the services of civil surgeons while the services of retired army medical officers had been rejected, had led to discontent and a feeling that the medical treatment of the troops would be wholly subordinate to purely military considerations; and would he cause inquiries to be made in the matter.—Mr. WYNDHAM replied: The services of 385 civil surgeons have been accepted principally for base hospitals and general duty; of these 363 are now in South Africa. This does not include those locally employed or attached to private hospitals or to the Yeomanry or the Rhodesian Field Force. 117 Royal Army Medical Corps officers under two years' service have been sent out. Of the 98 officers liable to recall, as has been already stated, 13 hold permanent military appointments at home, and very few volunteered for service in South Africa. Nothing is known of any general discontent to which the honourable gentleman refers in his question.

A Vaccination Case.

Mr. SINCLAIR asked the Home Secretary whether he was aware that Mr. F. J. Chatting was imprisoned for not paying a fine for non-compliance to an order for vaccination; that the warrant for his arrest was for Pentonville, but that he was taken to West Ham Police-station, then taken to Stratford Police-court, and kept without food from 8 A.M. to 8 P.M. on July 7th; and that on his arrival at Pentonville, instead of being treated as a first-class misdemeanant, his clothes were taken from him, and that he was forced to wear a prison suit, and that he was subjected to other treatment which the Act did not permit; and whether he would take such steps as would prevent a recurrence of such proceedings.—Sir MATTHEW WHITE RIDLEY replied: Chatting was not arrested till about 8.40 P.M. on the 6th. It was then too late to take him to Pentonville, so he was taken to West Ham Police-station and thence on the next morning to the police-court in accordance with the usual practice in order that he might go on to Pentonville by the afternoon van. He had breakfast at the station and might have had lunch at the police-court, but on being twice asked whether he wanted anything replied in the negative. At Pentonville the reception officer made a mistake and treated him like an ordinary prisoner. For this mistake he will be duly dealt with by the Prison Commissioners and it is not one which is likely to recur.—Mr. SINCLAIR: As I understand that no compensation will be paid to Mr. Chatting will some apology be offered to him?—Sir MATTHEW WHITE RIDLEY replied: I have not considered any question of compensation.

Hospital Provision in Scotland.

Mr. WEIR asked the Lord Advocate whether the Secretary for Scotland was aware that the medical officer of health for Ross and Cromarty in his report for last year stated that, in a township in the island of Lewis there were 41 cases of typhoid fever in a population of 300 within a period of six months and pointed out that, although an isolation hospital was urgently necessary the local authorities were powerless to provide one owing to the rates for the various parishes throughout the island being already so high; and in view of the insanitary condition of many of the parishes in the island would he consider the expediency of either urging the Treasury to provide the requisite funds for the erection of an isolation hospital or introduce legislation at an early date such as will admit of the Congested Districts Board applying a portion of the funds at its disposal for the erection and maintenance of isolation hospitals where urgently needed in the congested area.—Mr. WEIR further asked the Lord Advocate whether he was aware that the report of the medical officer showed that if the sanitary clauses in the Public Health (Scotland) Act were strictly enforced in the island of Lewis a large number of the inhabitants would be homeless; and could he state what steps he proposed to take in order to place the island on a satisfactory sanitary basis.—The LORD ADVOCATE replied: As to the sanitary condition of the island of Lewis, I must point out that the enforcement of the new provisions of the recent Public Health Act can be undertaken only gradually and with caution, both for the reason adduced by the hon. Member himself and because of the reluctance which he must know exists in the Highlands to removal and to isolated treatment of infectious cases. The Local Government Board are not inactive and I know from official and other channels that progress is being made, and that in some districts the present conditions compare very favourably with those observed not many years ago. I am informed by the Local Government Board that they are at the present moment in communication with more than one local authority in the island districts regarding new hospital accommodation, and plans are in hand for an hospital in the Carloway district. The Secretary for Scotland is not prepared at present to undertake legislation in connexion with the matter.

The Lunacy Bill Withdrawn.

The Bill of the Government for the reform of the Lunacy Laws, which had passed through all its stages in the House of Lords, was at this sitting of the House of Commons withdrawn.

TUESDAY, JULY 17TH.

The South African Commission.

Mr. BALFOUR announced that Mr. Harrison, general manager of the London and North-Western Railway Company, and Sir David Richmond, ex-Lord Provost of Glasgow, have agreed to serve on this commission in addition to Lord Justice Romer, Dr. Church, and Professor Cunningham.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, for publication in the next number.

BERTHON, ELLEN M. T., M.B. Lond., has been appointed a Locum Tenent by the St. Pancras Board of Guardians.

BRISCOE, WILLIAM THOMAS, A.B., M.D., M.Ch. Dubl., has been re-appointed Medical Officer of the Pewsham District by the Chippenham Board of Guardians.

BUCHANAN, R. J. M., M.D. Viet., M.R.C.P. Lond., has been appointed Honorary Physician to the Liverpool Stanley Hospital, vice C. J. Macalister, retired.

EMANUEL, J. G. M.B., B.S., B.Sc. Lond., has been appointed Pathologist to the General Hospital, Birmingham.

GRIFFITHS, CORNELIUS A., F.R.C.S., has been appointed Honorary Assistant Surgeon to the Cardiff Infirmary, vice W. Sheen.

HAWTHORNE, C. O., M.D., M.R.C.P., has been appointed Physician to the Central London Ophthalmic Hospital, Gray's Inn-road, W.C.

MEACHEN, G. NORMAN, M.B., B.S. Lond., M.R.C.S., L.R.C.P., has been appointed Resident Medical Officer to the Tottenham Hospital, N.

NEWINGTON, C. W. H., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer and Public Vaccinator for the Sixth Sanitary District of the Sevenoaks Union, vice C. F. Gregory.

PECK, HERBERT, M.D., D.P.H., has been appointed Medical Officer of Health to the Borough of Chesterfield, vice H. Meredith Richards.

PRANCE, C. H. G., L.R.C.P. Lond, M.R.C.S., has been appointed Medical Officer to the Workhouse and No. 1 Sanitary District, Plympton, and Public Vaccinator.

TROTTER, ALEX., M.D. St. And., L.F.P.S. Glasg., has been appointed House Surgeon to the Perth City and County Royal Infirmary.

WARDALE, J. D., M.B., B.S. Durh., has been appointed Honorary Ophthalmic Surgeon to the Royal Infirmary, Newcastle-upon-Tyne, vice G. E. Williamson, F.R.C.S.

WATTS, ELIZA T., M.B. Lond., has been appointed a Locum Tenent by the St. Pancras Board of Guardians.

WHITE, ANTHONY A. T., M.R.C.S., L.R.C.P., has been appointed by the Egyptian Government Medical Officer to the Directeur Générale des Reservoirs, Assouan District.

WILSON, H. C., L.R.C.P. Irel., L.F.P.S. Glasg., has been appointed Medical Officer for the South Sanitary District of the Poplar Union, vice W. M. Leslie, resigned.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BEDFORD COUNTY HOSPITAL, Bedford.—House Physician for six months. Salary £25 for that period, with board, lodging, and washing.

BIRMINGHAM GENERAL DISPENSARY.—Resident Surgeon, unmarried. Salary £150 per annum, with an allowance of £30 yearly for cab-hire, with furnished rooms, fire, lights, and attendance.

BOROUGH ASYLUM, Portsmouth.—Junior Assistant Medical Officer. Salary £120 per annum, increasing by three equal increments up to £150, with board, lodging, and washing.

BRADFORD ROYAL INFIRMARY.—House Physician for 12 months, unmarried. Salary £100 per annum, with board and residence.

BRECON INFIRMARY, No. 6, Bulwark, Brecon, South Wales.—Resident House Surgeon, unmarried. Salary £100 per annum, with furnished apartments, board, attendance, fire, and gas.

BRISTOL EYE HOSPITAL.—Locum Tenens for the House Surgeon for two months. Salary 2½ guineas a week, without residence.

CARDIFF INFIRMARY.—Assistant House Surgeon for six months. Salary at the rate of £75 per annum, with board, washing, and apartments.

CARLISLE DISPENSARY (not provident).—House Surgeon. Salary £150 per annum, with apartments (not board).

CHELSEA HOSPITAL FOR WOMEN, Fulham-road, S.W.—Registrar. Annual re-appointment, but tenable for three years. Honorarium 20 guineas per annum.

CHESTER GENERAL INFIRMARY.—Assistant House Surgeon for six months. Salary at the rate of £60 per annum, with residence and maintenance in the house.

CITY ASYLUM, Gosforth, Newcastle-upon-Tyne.—Assistant Medical Officer, unmarried. Salary £130 a year, with furnished apartments, board, &c., and rising £10 per annum up to £150.

CITY OF LEEDS, BECKETT-STREET FEVER HOSPITAL.—Resident Medical Officer. Salary £130 a year, increasing £10 annually to £150, with board, lodging, and washing. Applications to the Medical Superintendent, Manston Hospital, Seacroft, near Leeds.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria-park, E.—Resident Medical Officer. Salary £100 per annum, with board, &c.

CORNWALL COUNTY ASYLUM, Bodmin.—Junior Assistant Medical Officer, unmarried. Salary £120, rising £10 annually to £150, with board, furnished apartments, &c.

CORPORATION OF BIRMINGHAM.—CITY HOSPITAL, Lodge-road.—Second Assistant Medical Officer. Salary £120 per annum, with board, residence, &c.

DENBIGHSHIRE INFIRMARY, Denbigh.—House Surgeon for 12 months. Salary £100, with board, residence, and washing.

DUMFRIES AND GALLOWAY ROYAL INFIRMARY, Dumfries.—House Surgeon. Salary £50 per annum, with board and washing.

DURHAM COUNTY ASYLUM, Winterton, Ferryhill.—Assistant Medical Officer. Salary £140, rising £10 annually to £160, with board, laundry, and attendance.

GENERAL LYING-IN HOSPITAL, York-road, Lambeth.—House Physician for four months. Salary at the rate of £50 per annum, with board and residence.

HORTON INFIRMARY, Banbury.—House Surgeon and Dispenser. Salary £80 per annum, with board and lodging.

INGHAM INFIRMARY AND SOUTH SHIELDS AND WESTOE DISPENSARY, 74, King-street, South Shields.—Junior House Surgeon. Salary £75 per annum, with residence, board, and washing.

ITALIAN HOSPITAL, Queen-square, Bloomsbury, London, W.C.—House Surgeon. Salary £60 per annum, with board and residence.

JENNER INSTITUTE OF PREVENTIVE MEDICINE, Chelsea-gardens, London.—Assistant Bacteriologist to the Antitoxin Department at Sudbury, Harrow. Salary £200 per annum, with rooms.

LIVERPOOL DISPENSARIES, 34, Moorfields, Liverpool.—Four Assistant Surgeons, unmarried. Salary £100 per annum, with board and apartments.

MACCLESFIELD GENERAL INFIRMARY.—Junior House Surgeon. Salary £70 per annum, with board and residence in the Infirmary.

MANCHESTER HOSPITAL FOR CONSUMPTION AND DISEASES OF THE THROAT AND CHEST.—Assistant Medical Officer to the Out-patient Department, Hardman-street, Manchester. Honorarium £40 per annum.

NORTHAMPTON GENERAL INFIRMARY.—Assistant House Surgeon, unmarried. Salary £75 per annum, with furnished apartments, board, attendance, and washing.

NORTH STAFFORDSHIRE INFIRMARY AND EYE HOSPITAL, Hartshill, Stoke-upon-Trent.—House Surgeon. Salary £120 per annum, increasing, conditionally, by £10 a year, with furnished apartments, board, and washing.

NOTTINGHAM GENERAL DISPENSARY.—Assistant Resident Surgeon, unmarried. Salary £140 per annum, all found except board.

OLDHAM INFIRMARY.—Junior House Surgeon for one year. Salary £75, with board, residence, and washing.

PARISH OF SLEAT.—Medical Officer and Public Vaccinator. Salary £100 per annum. Applications to the Chairman, F. C. Manse, Sleat, Broadford, N.B.

ROYAL HALIFAX INFIRMARY.—Senior House Surgeon, unmarried. Salary £90 per annum, with residence, board, and washing. Also Third House Surgeon, unmarried. Salary £50 per annum, with residence, board, and washing.

ROYAL NATIONAL HOSPITAL AT VENTNOR.—Clinical Assistant. Salary £40, with board and residence. Apply to the Secretary, London Office, 34, Craven-street, Strand, W.C.

ROYAL SOUTHERN HOSPITAL, Liverpool.—Resident Locum House Surgeon for one month. Terms 3 guineas weekly.

SALOP INFIRMARY, Shrewsbury.—Assistant House Surgeon for six months. Salary at the rate of £60 per annum, with board and washing.

SHEFFIELD UNION WORKHOUSE INFIRMARY.—Junior Assistant Medical Officer for the Workhouse Infirmary, Fir Vale, Sheffield, for one year, unmarried. Salary £50, with furnished apartments, board, and washing.

STAMFORD-HILL AND STOKE NEWINGTON DISPENSARY, 189, High-street, Stoke Newington.—Assistant Resident Medical Officer. Salary £100 per annum, with board.

STATE OF SARAWAK, BORNEO.—Medical Officer for this Government, unmarried. Will be required to sign an agreement for three years. Salary $3600 (about £360) per annum, with free unfurnished quarters. Applications to Messrs. the Borneo Company, Sarawak Government Agents, 28, Fenchurch-street, London, E.C.

TEIGNMOUTH HOSPITAL, South Devon.—House Surgeon. Salary £70 a year, with board, lodging, and washing. In lieu of stimulants or mineral waters £6 per annum will be given.

THE Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act, 1897, for the Leith District of the Sheriffdom of the Lothians and Peebles.

TOTTENHAM HOSPITAL, N.—House Surgeon for six or 12 months. An honorarium at the rate of £20 per annum given, with board, residence, and laundry.

TUNBRIDGE WELLS EYE AND EAR HOSPITAL.—House Surgeon. Salary £60 per annum, with board, lodging, and washing.

UNIVERSITY OF GLASGOW.—Chair of Clinical Medicine.

WANDSWORTH AND CLAPHAM UNION.—District Medical Officer for the No. 2 District of the Parish of Battersea. Salary £100 per annum, with certain fees. The successful candidate will be appointed Public Vaccinator for the same District. Applications to the clerk, Union Offices, St. John's-hill, S.W.

WEST HAM HOSPITAL, Stratford, E.—Junior House Surgeon for one year. Salary £75 per annum, with board, residence, &c.

WEST KENT GENERAL HOSPITAL, Maidstone.—Assistant House Surgeon for six months. Honorarium at the rate of £50 per annum, with board and residence.

WILTS COUNTY ASYLUM, Devizes.—Assistant Medical Officer, unmarried. Salary £130, rising £10 a year to £160, with board, residence, and washing.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL, Wolverhampton.—Assistant House Physician for six months. Honorarium at the rate of £75 per annum, with board, lodging, and washing.

Births, Marriages, and Deaths.

BIRTHS.

GILLETT.—On June 30th, at Brooke, Norfolk, the wife of George Edward Gillett, M.R.C.S., L.R.C.P., of a daughter.

MACKAY.—On July 17th, at Castlegate, Berwick-upon-Tweed, the wife of William Bertie Mackay, M.D., M.R.C.S., of a daughter.

MATHESON.—On July 12th, at 72, Trafalgar-road, Greenwich, the wife of John Matheson, M.A., M.B., C.M., of a daughter.

PEAKE.—On July 14th, at The Limes, Marden, Kent, the wife of W. Harland Peake, M.D., B.S., of a daughter.

QUINBY.—On July 13th, at West View, Formby, Lancs., the wife of Edward M. Quinby, M.R.C.S., L.R.C.P. Lond., of a daughter.

SALISBURY.—On July 11th, at Evering-road, Stoke Newington, the wife of C. R. Salisbury, L.R.C.P, M.R.C.S. of a daughter.

SHAW.—On July 11th, at New Cavendish-street, Cavendish-square, W., the wife of John Shaw, M.D. Lond., M.R.C.P. Lond., of a son.

SINCLAIR.—On July 9th, at Cranbourne, Westerfield-road, Ipswich, the wife of Walter W. Sinclair, M.B., of a daughter.

SMITH.—On July 17th, at 229, High-street, Watford, the wife of G. Francis Smith, M.R.C.S., L.R.C.P. Lond., of a son.

STEAD.—On July 3rd, at Moor Lodge, Hawkhurst, the wife of C. C. Stead, M.B. Camb., L.R.C.P. Lond., of a daughter.

SWAIN.—On July 11th, at Victoria-square, Clifton, Bristol, the wife of James Swain, M.S., M.D. Lond., F.R.C.S., of a son.

MARRIAGES.

EDEN—BAIN.—On July 18th, at St. Mary Abbots', Kensington, by the vicar, the Rev. Canon Pennefather, assisted by the Rev. G. T. Harvey of Navenby, Thomas Watts Eden, M.D., M.R.C.P., to May, only daughter of Mrs. Bain, and granddaughter of the late Sir James Bath of Glasgow.

GOUGH—LONGSTAFFE.—On July 17th, at SS. Mary and John Church, Oxford, by the vicar, Rev. W. Scott, assisted by the Rev. W. D. Macray, rector of Ducklington, Bernard Bradly, son of Henry Gough, barrister-at-law, of Redhill, to Annie S., second daughter of Mrs. Longstaffe, of Oxford.

HENTSCH—PETERKIN.—On Thursday, the 12th inst., at St. Stephen's, Paddington, by the Rev. W. E. Burkitt, B.A., rector of Buttermere, Wilts, George Frederick Hentsch, L.R.C.P. Lond, M.R.C.S., younger son of the late George Hentsch of Chancery-lane and Barnsbury, to Beatrice M., youngest daughter of William Peterkin of Cl theroe, Lancashire.

WALDO—EXTON.—On the 14th July, at the parish church, Hampstead, by the father of the bride, Frederick Joseph Waldo, M.D., barrister-at-law, to Marion, elder daughter of the Rev. R. B. L. Exton, formerly vicar of Strood, Kent.

DEATHS.

GLAZEBROOK.—On July 14th, at Haymans-green, West Derby, Liverpool, Nicholas Smith Glazebrook, M.R.C.S., in his 87th year.

HEYCOCK.—On the 9th instant, at Hounslow, Francis Raworth Heycock, M.D., F.R.C.S., second son of the late Rev. C. Heycock, J.P. of Pytchley House, Kettering, aged 58 years.

LAKE.—On July 18th, at Bloemfontein, W. Wellington Lake, Militia Medical Staff, of Topcroft, Guildford, aged 46 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

"SAD DEATH AT MARHAMCHURCH."

UNDER the above title the *Western Morning News* of July 14th prints the following story:—

> Mr. D. Thompson, county coroner, held an inquest at Marhamchurch on Thursday on Selina Matthews, wife of a farm labourer, who died on Wednesday morning. James Matthews said his wife, 30 years of age, was confined of her fifth child on Monday night. She was attended by an "occasional" nurse, and had no doctor. After her confinement she complained of her head, and he went to Mr. Braund on Tuesday afternoon and got some medicine, but did not ask him to visit her. She took some medicine and afterwards for a while was cheerful, but then became drowsy and never rallied, dying on Wednesday morning. She was very sick. Her sister was with her on Tuesday and the neighbours looked in.—The Foreman (Mr. Greenaway): Is it usual for a medical man to supply medicine to patients without seeing them?—The Coroner: It is not unusual. If medicine only is applied for he would do the best he could without a visit. Of course, if asked to see a patient he would not supply medicine until he had first seen the patient.—Mr. Greenaway thought it unusual and would have liked to have heard whether the effects of the medicine given were such as were expected.—The Coroner offered to adjourn the inquest to procure medical evidence, but the jury thought it not necessary.—Mary Ann Cowling, the occasional nurse, said all went satisfactorily. When deceased complained of her head witness recommended sending for a doctor. She was slightly convulsed just before her death.—Emily Jones, a neighbour, said she saw the deceased daily and did not anticipate any danger. She seemed pretty well on Tuesday night, but still complained of her head. On Wednesday morning she was heavy and drowsy and did not speak. She then considered her condition alarming and asked that a doctor be sent for. One was sent for, but death took place before his arrival.—The jury returned a verdict of "Death from natural causes—failure of the heart's action after convulsions."

We cannot agree with the jury that it was unnecessary to hear medical evidence in this case. In the interests of the medical man the jury should certainly have ascertained (1) what the husband told Mr. Braund that his wife was suffering from and (2) what Mr. Braund felt himself able to prescribe under the circumstances. We agree with the foreman that to give medicine to a patient who is not visited is unusual and we may add that as a rule it is very inadvisable; but we do not say that it was inadvisable in this case because we have no notion what the husband said. The "occasional" nurse who said that "all went satisfactorily," might also have been asked what significance she attached to the word "satisfactorily" and under what circumstances she was in the habit when occasionally nursing of sending for medical assistance.

"THE EVER-READY ELECTRIC LIGHT."

To the Editors of THE LANCET.

SIRS,—We notice in THE LANCET of July 14th (p. 111) a description of the "Ever-Ready" Electric Light which Mr. Dale states is made by him. We should very much like to know if he is the manufacturer as we can supply the identical article which is made in America. We beg to hand you a drawing which you will see is the same in every way.

We are, Sirs, yours faithfully,

London, July 17th, 1900. ARNOLD AND SONS.

*** The drawing sent to us by Messrs. Arnold and Sons is undoubtedly identical with that which we published last week. Mr. Dale will, perhaps, state whether he is the inventor or maker. We certainly supposed one or other to be his position.—ED. L.

A QUESTION OF LIABILITY.

AN interesting point was raised in a case which came before Judge Stonor on July 10th at Brompton. A surgeon dentist had rendered professional services to one of the students at the hospital to which he was attached. The latter was under age at the time, and had since joined the troops in South Africa, leaving his dentist's account unpaid. The action in question was for the recovery of 16 guineas from the young student's father, who is a medical man. The plaintiff said that had he charged his usual fees the account would have amounted to £36, and that he made the reduction because the young fellow had studied under him at the hospital. The student, it was stated, always said that his father would pay the dentist's fees, and about a year later the account was accordingly sent in to the father. The latter returned the account repudiating liability; and, in the course of correspondence, said that his son appeared to have been under the impression that a surgeon, medical man, or dentist would not as a rule make any charge when attending a medical student, especially when both, as in the present instance, were connected with the same hospital. The father went on to remark that the fees seemed to be rather high, and asked to be favoured with the views of the dentist as to payment by students in such cases. In another letter the father stated that he had consulted certain hospital authorities, and that they had advised him not to pay the account. The plaintiff, in his evidence, stated that he distinctly told the young fellow that he could not afford to attend the students at the hospital free of charge. His Honour said it was evident that the student had pledged his father's credit, but there was some doubt as to the father's liability. Counsel for the plaintiff maintained that the attendance in question was necessary to the young fellow's health, and that the father was therefore liable. Counsel for the defence contended, on the other hand, that if the son had been living with his father at the time that the services were rendered, there might have been something in the submission of the plaintiff's counsel, but as a matter of fact the son was in lodgings at the time. The learned counsel went on to contend that as the plaintiff had not the defendant's authority to render the services, the latter was not liable. His honour said he was not convinced that the attendances in question came under the heading of necessities within the meaning of the Acts relating to the point. There was evidence that the student pledged his father's credit, but there was no evidence that the father gave him authority to do so. This being so, his Honour found that the defendant was not liable. The case was struck out, no costs being allowed.

WANTED—A HOME.

To the Editors of THE LANCET.

SIRS,—Could any of your readers inform me of a medical man residing in a small seaside place or in the country about North Wales or in the north of England or some quiet place over 100 miles from London, who would be willing to receive into his house a lady subject to periodical fits of depression and who at these times is inclined to excessive indulgence in stimulants. The lady is between 50 and 60 years of age, is troubled six or seven times a year, and is willing to be advised and guided to overcome her weakness. She would pay £1 15*s.* per week for her board, &c., as a paying guest, and the undersigned can testify that the lady is an intelligent and pleasant person.

I am, Sirs, yours faithfully,

Earl's Court-road, W., July 16th, 1900. J. ROSS MACMAHON.

SANITARY PROPAGANDA.

To the Editors of THE LANCET.

SIRS,—In many rural districts the sanitary authorities issue printed leaflets for distribution amongst cottagers. These leaflets contain instructions how to act when notification diseases appear. Can you kindly inform me where such can be obtained and which is the best form for scarlet fever and diphtheria?—I am, Sirs, yours faithfully,

July 16th, 1900. HEMERA.

*** The medical officer of health composes his own propaganda to the people under his sanitary charge. (See the paragraph entitled "Precautions against Diarrhœa.") If any medical officer of health has designed a leaflet that he thinks would be useful to our correspondent and will send it to us we will forward it to its destination and say at the same time who is its author.—ED. L.

PRECAUTIONS AGAINST DIARRHŒA.

DR. E. M. SMITH, medical officer of health of York, has issued a leaflet for distribution which contains valuable advice to the community under his charge. He is dealing with the prevention of summer diarrhœa, and the burden of his words is that cleanliness, and cleanliness alone, will prevent this disease that is so often fatal in epidemic form to children. "Keep your house clean in every part,' he says. "Keep yourselves and your children and their clothing clean. Keep your sinks, gulleys, and closets clean with brush or mop and hot water and soda. Flush them frequently with cold water. Keep the windows of your living rooms and bedrooms open by day and your bedroom windows open by night. Don't block up your bedroom chimneys and fire-places. Keep all feeding utensils constantly clean and sweet with boiling water. Don't let dust, or manure, or kitchen refuse (vegetable refuse, potato parings, tea leaves, bits of meat or fish, &c.) collect in the house or yard. Burn the kitchen refuse on the fire. Never allow choked drains, or choked closets, or offensive accumulations near your house to remain unattended to. Report them and also report badly-paved yards. Don't keep poultry in your yard. Use disinfectants such as chloride of lime freely to drains, gulleys, closets, and privies. Ask for some at the sanitary office. Don't allow your house to be damp without reporting it to the sanitary office." We trust the people of York will take this excellent advice.

"WHO IS MR. W. HARTLEY AUSTIN"?

To the Editors of THE LANCET.

SIRS,—In THE LANCET of July 14th, p. 147, you are good enough to refer to a circular issued by myself to medical men on the subject of investments at compound interest and simple interest. You evidently desire to know the *bona fides* of the investment referred to, and as it is a subject which has created much interest amongst medical men (many of them investing largely) I have pleasure in replying to your queries. I do not wish to obtain a gratuitous advertisement, but I trust you will give my reply the same prominence that you have given your criticism. The company referred to as guaranteeing the investment is the Sun Life Insurance Company of Canada. The assets of this office (invested under stringent supervision of the Canadian Government) at the

present moment exceed £2,000,000 sterling. It reports annually to the Board of Trade in this country and it has appointed three trustees to look after the interests of policy-holders and investors here—viz., the Marquis of Dufferin and Ava, the Earl of Albemarle, and Sir Charles Dalrymple, Bart., M.P., who holds £100,000 in trust as special security. The company has been established since 1865 and its bankers are the Bank of Scotland. Regarding the investment itself, as stated in my circular the principal attraction is that under it any healthy man can set aside a moderate sum each year (just so much as he can afford to save against retirement later on in life, with the drop in income which retirement always entails to a medical man), accumulate same at compound interest, drawing the result either in cash or as a yearly addition to the income. You are, of course, perfectly right when you say that most medical men know that an investment at compound interest increases more rapidly than one at simple interest, but how many men realise the extraordinary difference there is between compound and simple interest. Here is an example (very far-fetched, of course, but it serves to illustrate my meaning) which appeared in one of your contemporaries a short time since. If a penny had been invested in the year 1 at 5 per cent. compound interest it would now amount to no less than 56,535,727 quintillions of pounds sterling. The same penny invested at 5 per cent. simple interest would not amount to eight shillings! I do not suggest that any medical man can set aside a penny and accumulate it for 1900 years, but I do suggest, and that most emphatically, that he cannot do better than set aside £10, £20, £50, £100 a year, or any sum he can spare, and let it accumulate for, say, 20 years under the security I have named. Should the investor unfortunately die, even a day after payment of his first deposit, all further cost immediately ceases, and the company guarantees to hand over either a large sum in cash, or to pay a yearly income to wife, child, or other dependant. Thanking you for the very fair criticism you made on my circular, and holding all further information at your disposal,

I am, Sirs, yours faithfully,
W. HARTLEY AUSTIN.

93, Queen Victoria-street, E.C., July 14th, 1900.

THE WAY TO SPREAD DISEASE.

IN spite of legal enactments, of health lectures, and the advance of general intelligence of which we are so proud, instances of ignorance or recklessness still occur. An inspector of nuisances saw a child playing in the street at Weaste on July 1st "in the peeling stage of scarlet fever." On the next day he went to the house and found the child, instead of being isolated, playing in a living room. On the 5th the child was seen again in the street. A fine of £1 and costs was imposed. The stipendiary spoke seriously to the parents, and we may presume that they were impressed thereby.

REMEDIES FOR SEA-SICKNESS.

To the Editors of THE LANCET.

SIRS,—I have been appointed surgeon to a steamer of one of the Atlantic lines and whilst a good sailor myself I have no doubt I shall find many of my fellow voyagers suffering from sea-sickness. Could any of your sea-faring readers kindly tell me what remedies he has found most effectual in the treatment of this distressing complaint? Any suggestions will be esteemed a favour by

Yours faithfully,
July 13th, 1900. SHIP'S SURGEON.

"A GOOD BICYLE SADDLE."

A CORRESPONDENT, "B," asks a question in THE LANCET of July 7th, page 70, to which, in ignorance of the querist's physique, it is impossible to give a satisfactory answer. A cyclist requires to be measured for his saddle just as much as for the garments he wears when riding. What suits a man with lean thighs will be found extremely uncomfortable by the possessor of rounded limbs, and *vice versâ*. Again, there are riders who cannot bear pressure on the perineum, whereas others—with, for instance, a tendency to procidentia recti—must have support in that region. There are many so-called anatomical saddles in the market, but no particular pattern can be recommended for all and sundry. If "B" were to write to any well-known firm of saddle-makers describing his physical conformation and disabilities (if any) he would no doubt succeed in obtaining what he wants. There are so many firms turning out equally good articles that it would be invidious to make a selection. "B" can, however, find names and addresses in the advertising columns of cycling journals. With regard to position it is unquestionably true that by perching himself upon an inclined plane and bending his body forwards at an acute angle in the ungraceful manner that is adopted by the numerous class of cyclists known as "scorchers" the rider is able to exert a slightly greater amount of propelling force than he can when sitting upright, but there are happily objections to the stooping posture which more than counterbalance this advantage. In the first place persistence in the hunchbacked attitude not only conduces to the production of high shoulders, narrow chests, and rounded backs, but it also, to a great extent, deprives the devotee of speed of the ability to enjoy delightful scenery and objects of interest. His neck curved downwards and his head protruding in tortoise guise, he can see nothing but the space immediately in front of his rapidly revolving wheel. At a rate which cannot but be startling to even experienced pedestrians he silently flashes past, the embodiment of anything except the poetry of motion, and as he momentarily glances upwards the expression in his straining eyes is precisely the same as that which their misfortune has imposed upon the victims of dorsal caries. A dignified cyclist holding his head heavenwards like a man and not earthwards like a beast is a spectacle to admire; but although he may succeed in covering more miles within the hour the grovelling scorcher is nevertheless an execrable object who, for no good or useful purpose is content to sacrifice everything that is æsthetic on the altar of celerity.

RADIOGRAPHIC EQUIPMENT.

MESSRS. ISENTHAL & Co., of 85, Mortimer-street, Cavendish-square, W., have submitted to us their new list of radiographic apparatus. We note that their "x" ray laboratory is connected with both the continuous and alternating current so that the working of every instrument in the list can be shown by those who contemplate studying the subject in its practical aspects. The list contains a description of the "tubes" which according to experience are best for all practical purposes. In addition all the photographic and other accessories which make an equipment complete are given.

Senex.—The purchase value is estimated on the gross annual receipts and a three years' average would be a fair way of estimating it. The purchaser is sure to require an inspection of the books and so will be able to judge how far the last three years' work represents an increase or decrease in the practice. With the introduction that "Senex" proposes to give, it would be usual to ask for the half share a sum equivalent to the gross average annual receipts of the practice. We think our correspondent would be well advised to employ an agent.

W. H.—The notice would certainly seem to be designed to steal a march upon a professional brother. Where is the said notice "put up" and how much publicity has it received? Our correspondent will understand that if we comment on this matter the fact that we obtained our information from him may be obvious whether his name is mentioned or not.

Delta.—We cannot say whether the General Medical Council would, on a complaint being made, construe such an action as infamous in a professional respect, but thus to assist an unqualified person to practise medicine by writing the legal certificates for him is, in our opinion, covering and a very grave breach of professional manners.

Rivers.—We understand that it is the author's intention to treat the subject as a whole and it would be as well to make the illustrations generally illustrative and not to confine them to views of one sanatorium.

Jupiter will find the information he requires in THE LANCET of Sept. 9th, p. 724, and of Sept. 23rd, 1899, p. 851. The lists are no longer exhaustive.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, July 19th, 1900.

Date.	Barometer reduced to Sea Level and 32° F	Direction of Wind.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. Shade.	Min Temp	Wet Bulb.	Dry Bulb.	Remarks at 8.30 A.M.
July 13	29·79	N.	...	123	86	63	65	69	Hazy
,, 14	29·93	S.W.	...	121	72	61	62	65	Cloudy
,, 15	29·95	S.W.	...	123	84	58	63	70	Fine
,, 16	30·05	S.E.	...	136	95	64	68	72	Overcast
,, 17	30·22	N.	...	123	86	65	65	70	Hazy
,, 18	30·20	S.W.	...	123	89	64	65	70	Fine
,, 19	30·03	S.E.	...	124	92	66	65	70	Hazy

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (23rd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (2 P.M.).

TUESDAY (24th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M. and 6 P.M.), Royal Ear (3 P.M.).

WEDNESDAY (25th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), Cancer (2 P.M.)

THURSDAY (26th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.) University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), St. Mark's (2 P.M.).

FRIDAY (27th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M., Ophthalmic 10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), Lonpon Throat (2 P.M. and 6 P.M.).

SATURDAY (28th).—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), London Throat (2 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MONDAY (23rd).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Dr. A. Whitfield: Consultation. (Skin.)

LONDON THROAT HOSPITAL (204, Gt. Portland-street, W.).—4.30 P.M. Dr. Cathcart: Miscellaneous Cases. (Post graduate Course.)

WEST LONDON POST-GRADUATE COURSE (West London Hospital, W.).—5 P.M. Mr. Bidwell: The Preparation of Patients before and the Treatment after Operation.

TUESDAY (24th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Dr. J. E. Squire: Consultation. (Medical.)

WEDNESDAY (25th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Dr. A. Hillier: Consultation. (Medical.)

THURSDAY (26th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. J. Hutchinson: Consultation. (Surgical.)

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND (11, Chandos-street, Cavendish-square, W.).—9 A.M. Educational Committee. 9.30 A.M. Parliamentary Committee. 10 A.M. Council Meeting. 11 A.M. Fifty-ninth Annual Meeting. Election of Officers and Committee. 2 P.M. Dr. F. Beach: Presidential Address.—Dr. W. W. Westcott: Inebriety, its Causes, Results, and Treatment.—Dr. F. Daunt will read a paper. 8 P.M. Annual Dinner at the Whitehall Rooms, Hôtel Métropole.

FRIDAY (27th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. M. Gunn: Consultation. (Eye.)

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND (11, Chandos street, Cavendish-square, W.).—10 A.M. Microscopic Demonstrations, Preparations, Specimens, and Lantern Slides:—Dr. W. F. Robertson, Dr. J. S. Bolton, and Dr. G. A. Watson. Dr. H. H. Newington will exhibit and describe the Plans of the New East Sussex Asylum. Dr. D. Orr and Dr. T. P. Cowen: A Contribution to the Morbid Anatomy of General Paralysis of the Insane (microscopic and lantern demonstration).—Dr. J. O. W. Barratt: Two Cases of Lepto-meningitis (microscopic and lantern demonstration).—Dr. J. Turner: Some Alterations produced by Disease in the Giant Nerve-cells of the Cortex (microscopic and lantern demonstrations).—Dr. L. C. Bruce and Dr. H. de M. Alexander: Observations upon the various Physical Changes in the Acute and Subacute Stages of Melancholia. 2 P.M. Mr. C. F. Beadles: The Insane Jew.—Dr. W. C. Sullivan: Alcoholic Homicide.—Dr. D. Blair: Non-diabetic Glycosuria.—Dr. A. F. Shoyer: An Angeioma of Broca's Convolution in a Lunatic.—Dr. F. W. Edridge-Green: Psycho-physical Perception.

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Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

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DURING the forthcoming meeting of the British Medical Association at Ipswich the representatives of THE LANCET can be consulted at the Great White Horse Hotel, Ipswich, with regard to our reports of papers and proceedings.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. I. of 1900, which was completed with the issue of June 30th, and the Title-page to the Volume, were given in THE LANCET of July 7th.

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VOLUMES for the first half of the year 1900 are now ready. Bound in cloth, gilt lettered, price 18*s.*, carriage extra.

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